APPLE GROWING IN NORTHERN WISCONSIN.

An Address Delivered before the Brown County Horticultural Society, by Robert Chapell.

The subject for discussion this evening, and upon which it has been made my duty to present some opening remarks, is Apple Growing in Northern Wisconsin. In considering this matter heretofore, it has been our custom to compare the merits of well known eastern varieties, taking it for granted that among them, a few at least could be found well fitted for the peculiarities of our soil and climate. Now I wish to present for consideration two questions—Have we not taken too much for granted? and if yes, what are we going to do about it?

To my mind "the logic of events" has already answered the first question. Tens of thousands of the most noted varieties of eastern apples have been planted in Northern Wisconsin during the last twenty years, and where are they now? Complete or partial failure has been the rule, and apparent success even, a very rare exception. So general is the admission of this fact, that many have abandoned the idea of any further planting, or are contenting themselves with some varieties of the Siberian crab, which, except for special purposes, are of little value, and in fact, are hardly worthy to be called apples at all.

We have no right to say that these failures are all due to neglect or improper methods. It is true that in many instances the young plantations have not had a fair chance, but in a majority of cases these experiments have been made by people born and reared among the orchards of New England, New York and Ohio, who have given their young trees the same kind of culture, and as good as is customary in those states. And these people have not rested with one trial. When their first trials failed they "possessed their souls" with what patience they could, got other varieties which they hoped
might better answer the purpose, and subjected them to some-
what different treatment, but generally with a similar result.
All the known good varieties have in this way been tested
again and again. How long is it necessary to persevere in
this waste of patience, time and money, before the question
may be considered settled? Is not a period of twenty-five years
enough?

Some of our horticulturists are encouraging hopeful ex-
pectations of new varieties from Russia, it appears to me
without sufficient reason. We must remember that the
southern portion of Russia, which is the fruitful portion,
although a trifle further north than the place where we stand,
is not necessarily colder than here or as cold. It is in fact,
between the same parallels of latitude as France, Switzerland,
Austria and Northern Italy, the home of many varieties of
fruit which will not endure our climate at all. The most
noted of our Russian apples are Red Astrachan, Duchess of
Oldenburgh, Alexander and Tetofsky. The first two have
lately lost their distinctive character of "iron clad." They
were certainly originated in Southern Russia. The Alexan-
der is a superb fruit in appearance only, its place is the kitchen.
Tetofsky is now on trial here, and whether it succeeds or not,
is not a first-rate fruit.

The only Canada apple which holds a prominent place
among us, is the Fameuse or Snow Apple; and this is the one
apple of all the superior varieties that have been tested here
in which I have any confidence. But one apple will not answer
our purpose even if it could be safely depended on.

Now the apple is pre-eminently the fruit of temperate
climates. Maine, New Hampshire, Vermont, Northern and
Central New York and Canada, produce in abundance the
best apples in the world, all of which places have a climate as
rigorous as our own, and the idea that we cannot have at some
time good orchards, good apples, is incredible.

We have tried a great variety of trees from a great variety
of places and nurseries. We have given them every variety
of culture, good, bad and indifferent. We have planted upon clay, upon sand, upon loam, upon gravel, upon the hills, upon the plains and in the valleys. We have planted in the spring and in the fall. We have planted deep and we have planted shallow. We have planted them perpendicular and at an angle leaning to the south. We have cut off the tap roots and we have left them on. We have pruned in spring, in summer and winter. Root pruned, top pruned and left unpruned. We have sworn at different times by low heads and high heads. We have treated them with manure and without it. We have plowed our orchards and left them in grass. We have protected their trunks from the freezing and thawing of early spring, and we have left them to face it out in their own way. We have washed them with soap suds and solutions of sal soda and potash. We have painted them with whitewash and with unsavory compounds that shall be nameless. We have plugged them with sulphur, camphor, calomel and other potent drugs. We have tried top grafting and crown grafting and root grafting. We have tried Standards, Small Dwarfs, Medium Dwarfs and Dwarfs upon their own roots. We have done everything I believe, but one, and the result has been wonderfully uniform, failure, disappointment, disgust.

The only thing that we have not tried, in any systematic way, is the productions of new varieties, that shall be in one sense natural to the Northwest.

It may be stated as a rule, with but few exceptions, that plants and fruits succeed best in the places of their origin. A notable instance of this is found in the Rhum Palmatum, or Turkish Rhubarb, which when brought to France and most carefully cultivated, has proved worthless. In applying this rule to the apple, we must not take it in its largest sense, for it is not a native fruit, although it reaches here its greatest perfection. What is meant, is that any good variety of apple, will, as a rule, succeed best in the locality where it originates. Thus Swaar, Spitzenburgh and Newtown Pippins, originated in Eastern New York, and the Northern Spy in Western New York.
The Balwin, Benoni and Roxburg Russet, in Massachusetts; the Belleflower in Pennsylvania, or New Jersey, and Pecks Pleasant and the Seek-no-further in Connecticut. The list might be largely extended, of apples famous in the localities where they originated, and that do not succeed as well in any other. All the above named famous apples have been tried in this region and found wanting.

Now, if it is true that we are in the natural climatic range of the apple; that there is no obvious unfitness in our soil; that the good varieties brought from a distance have in most cases failed; and that fruits are best and hardiest in the localities where they originate, can we not see pretty plainly what course we ought to pursue? Is it not plain that the Horticulturists of the Northwest ought to attempt the production of new varieties, better fitted for the conditions of the country? Children of the soil, that shall be at home in the peculiarities of our climate?

There are two methods of producing new varieties of fruit, though I believe both may be ultimately referred to the same principle. First, by artificial cross breeding, and second by successive reproduction.

It is about seventy-five years since Thomas Andrew Knight, President of the London Horticultural Society, introduced the practice of cross breeding in fruit, by which means he produced many new and valuable varieties.

Crossbreeding is simply the mixing of two varieties of the same species of fruit, by means of the blossoms. The blossoms of the apple are of the form sometimes called perfect, that is, each individual blossom contains within itself, all the organs necessary to reproduction. So that the blossom of a Spitzenburg in an isolated position, will always produce a Spitzenburg and nothing else; but if by any means it becomes fertilized by pollen from another variety of apple, although the fruit will still be a Spitzenburg, its seeds when planted, will produce a new fruit, more or less resembling both its parents. And herein is the whole theory of crossbreeding.
I may here say that crossbreeding is practiced only between varieties of the same species. The apple and pear, though sometimes so much alike, are of different species. Hence, no one has yet succeeded in crossing them. In rare instances crosses are made between species nearly allied, the result is then properly called a hybrid or mule. Hybrids are not generally reproductive, the race ending with the first generation.

The process is simple, though it requires delicate handling. The pistil is the central raised portion of the flower, at the base of which is the embryo fruit. The summit of this pistil is called the stigma. The outer circumference of the face of the flower is occupied by the stamens, which terminate in the small capsules or anthers, which contain the fertilizing dust or pollen. The use of the pollen is to fertilize the young fruit as the base of the pistil.

Before the flower has fully matured, these stamens are with a pair of scissors, cut entirely away. Then from a flower on another tree, at a time when the pollen is matured (that is dry and powdery) it is collected by a small fine brush and deposited on the stigma of the flower from which the stamens have been removed—and the work is done. This must be done at the right time—that is when the pollen is dry and fine, and the stigma is moist enough to retain it.

This practice is in great use by florists, for producing new and beautiful flowers.

The method of originating new varieties by successive reproduction, if not strictly a natural process, is less artificial than that of crossbreeding. A fruit tree strictly in its natural state, will (as a rule) reproduce itself continually by seed without variation. But when subjected to new conditions, and careful cultivation, its seeds are more likely to produce a fruit varying somewhat from its natural character.

The greatest difficulty is in producing the first improved generation. When it has once moved out of its natural state, it is then fairly in the way of improvement. Each successive replanting of the seed is likely to produce better and still bet-
ter results, till the fruit has reached the boundary of its capacity for improvement.

Now although it is true that the best apples in the United States have been originated by the replanting of seed, yet for want of the proper application of the true principle, the best results have been accidental.

It is a singular declaration to make, and yet I believe it is true, that the more carefully the seeds have been selected, the more unsatisfactory have been the results.

Granting that the capacity for improvement in any given variety of fruit, is limited, and that according to the theory of VanMonz, this limit may be reached in a few generations, we have a very plain reason for this fact. For when a fruit tree has arrived at perfection (there being an inherent tendency to return towards its original state), not one of the varieties produced from its seeds will be better than itself, but probably all will be much worse, now when sowing for fruit it has always been customary to select seed from the best fruit available; in short, from varieties that have already arrived at the end of their march to perfection.

Hence, in latter days, not one seedling apple in a thousand has proved to be really of first rate quality. In strong confirmation of this theory, we may note the declaration of Duhamel, that for fifty years he had been in the habit of planting seeds of the best varieties of table pears in France, without producing a single valuable variety. It may also be remembered the results of first planting of the New England colonists were very unsatisfactory; so much so, that some concluded that the country was not adapted to the production of the best apples; but in fact they had been too careful in the selection of their seed. They had brought to this country seeds of varieties that had reached perfection already.

Now this is no fanciful theory. It has been tested in a most thorough and systematic way. I have already mentioned the name of Van Monz. This gentleman was a resident of Louvain in Belgium. A man of scientific attainments, and an
ardent pomologist. He devoted the greater part of his life to the cultivation and the amelioration of fruits; chiefly upon the plan of successive reproduction from seed. His experiments were conducted on a large scale, were extended through many years, and were in my mind entirely conclusive.

Belgium is said to be the paradise of pears, and to the improvement of this fruit he gave most attention. He experimented largely however with apples and stone fruit.

It is stated by Downing, that in 1823, the nurseries of Dr. VanMonz contained two thousand seedlings of merit. One result of his experiments was, to convince him, that seed from an old tree was more likely to produce inferior fruit, than seed from a young tree of the same variety.

His manner of proceeding was this:

Gathering his seeds from a young seedling tree, not a wild one, but one that is already in a state of variation, he plants them in a seed bed. When they have grown to a sufficient size to enable him to form some idea of their character and constitution, he selects the most promising individuals, takes them up and cuts off the tap roots. He then plants them in nursery rows, only a few feet distant from each other. Here he leaves them, with an occasional heading in of the longest branches, till they produce their first fruit. From the most promising specimens of fruit, he takes the seeds and plants again, subjecting the young trees to the same treatment, until fruit is again produced.

The process is again and again repeated, each generation producing better fruit and coming earlier into bearing than its immediate predecessor, till in the fourth or fifth generation the varieties produced are nearly all of fine quality.

It was found by him, that different species of fruit required different periods of time to arrive at what he called perfection. He thought that, as a rule, pears would require five successive generations, Apples four, Peaches, Plums and other stone fruit but three.

It should be mentioned that VanMonz thought that the
fruit for this process should be gathered before full maturity, and allowed to rot before removing the seeds; believing that this would have a tendency to subdue somewhat the original coarseness of the tree. He says of himself:

"I have found this art to consist in regenerating in a direct line of descent, and as rapidly as possible an improving variety taking care that there shall be no interval between the generations. To sow, to resow, to sow again, to sow perpetually, in short to do nothing but sow, is the practice to be pursued, and which cannot be departed from; and in short, this is the whole secret of the art I have employed."

Whatever may be thought of his theory and practice, it is certain that VanMonz originated many varieties of superb fruit. In Downing's list of pears are found over twenty varieties produced by him. Though Mr. Downing evidently favors the system of cross breeding, because it is more scientific and produces its results in shorter time, he uses with regard to it these hopeful and encouraging words:

"An American gardener will easily perceive from what we have stated a great advantage placed in his hands at the present time, for the amelioration of fruits by this system. He will see, that as most of our American varieties of fruit are the result of repeated sowing, more or less constantly repeated, he has before him almost every day, a part of the ameliorating process, in progress, to which Dr. VanMonz beginning de novo was obliged to devote his whole life. * * * * Our own experience leads us to believe, that he will scarcely have to go beyond two generations to obtain fine fruits."

Now I am thoroughly convinced that the idea of further experiments with the old varieties of apples ought to be abandoned by us. I believe that if we are to have any successful Orchard culture, it must be with new varieties, originated in our own climate; and so believing, it seems to me to be the duty of Horticultural Societies and individuals to set about the production of them at once. I have endeavored to describe with sufficient minuteness the two ways by which it may be
done. First, by cross breeding. Second, by repeated planting.

The first may be too difficult for general use, but any one who knows enough to select and plant seeds, is master of the second process. To those of us who have reached the time of gray heads and gray beards, the idea of waiting so long for the perfection of the fruit of our planting, may seem discouraging. But can we not act sometimes from motives above the level of selfish gratification.

If our forefathers had not planted, where would now be the fruit. We owe it to our children to provide for them at least as good fruits as our fathers provided for us. Let us pay our debts if we do no more. Moreover, every true gardener experiences much more satisfaction in directing and watching the process of producing good fruit, than he does in eating it.

But after all, the process need not be so tedious as it seems. For we have Downing’s authority for expecting that fine fruit can, with us, be produced by two plantings. And a fortunate selection of seed may yield superior fruit in the first generation. Besides, there are other methods of hastening the maturity of specimen fruit that we have not now time to discuss. And whoever shall be so lucky as to originate a first rate hardy variety of apple, will not only be a public benefactor, but will put money in his purse, and plenty of it.

For myself, I have finished my experiments with eastern varieties of apples; but to those who wish still further “to see the folly of it,” I would say, plant seeds notwithstanding and let the two experiments progress side by side. The one need not hinder the other.

I wish to urge, as briefly as possible one other reason for seed sowing. Time will not allow me to argue the question of the superior vitality of seedlings. I take it for granted that a seedling tree is always, under the same conditions, more hardy than a grafted one.

I also assert that for this region, a hardy stem is the first
requisite for a fruit tree, because most of our apple trees at least, die from diseases of the stem—chiefly, in my opinion, in consequence of sudden freezing and thawing in early spring.

Now if these things are so, there is encouragement for those to plant once, who are not willing to make successive plantings. To such a one I would say, select your seeds according to rules already set forth and sow them in a good seed bed. When they have had one years growth take them up carefully and cut off the tap root. Reject all that are not strong and thrifty. Plant in nursery rows and keep as carefully cultivated as if they were cabbages. When large enough to set in the Orchard, reject all but the best. Do not waste ground, labor and time on an unpromising tree. At the first fruiting, if the fruit is not worth cultivating, graft in the top with some hardy variety that suits you better and you have a grafted tree, made strong in its weakest part—the stem.

At the first fruitage of such an Orchard some really good fruit would be shown, and the poorest of it would probably be better than the crabs with which we are now filling the vacant spaces in our dying orchards.

Mr. President:—In view of the fact that this paper was intended merely to introduce the subject for discussion, I don’t know but I ought to apologize for its length. But “a new departure” seems so necessary for us, and I have said so little of what ought to be said upon the subject, that it appears to me that I have barely introduced the matter after all.

Robert Chappell.