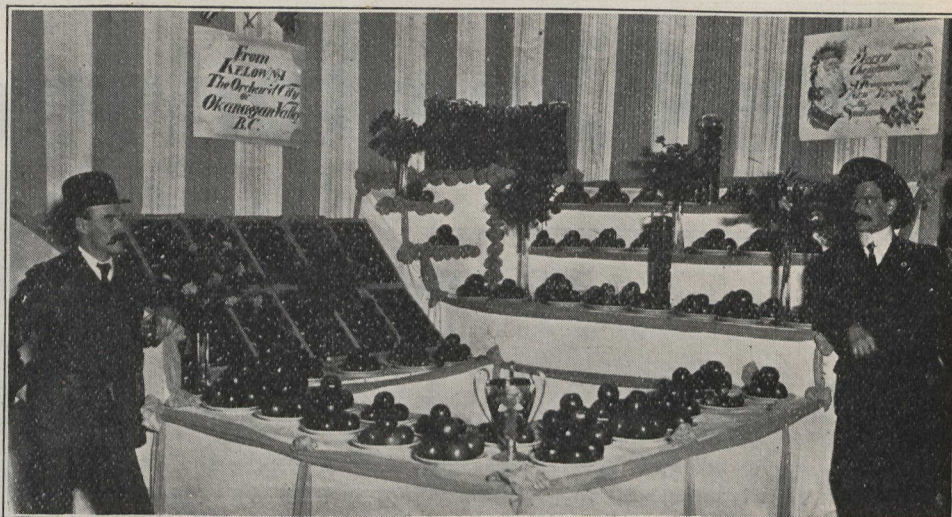


seldom equals the western product in color. The package and packing scores are very comprehensive, however, and well worth adoption elsewhere.

Other important winnings were ten boxes Jonathan; one of the items in this prize was a \$2,000 fruit farm at Edendale, Wash. Best four-tier box Jonathan. This variety is very widely grown west of the Rockies, there was consequently great competition. First for ten boxes Northern Spy and first for plate of same variety. The prize for best ten boxes included a \$1,200 fruit farm in the state of Washington, so that this "orchard city" of British Columbia has now added to her qualifications the distinction of being a United States landlord.

As several of Kelowna's prizes have been mentioned in the columns of THE CANADIAN HORTICULTURIST before, I will touch on but one more of them,—the second prize for the exhibitor winning greatest number of first prizes. As we missed first prize by but three points, we are justly proud of our second place.

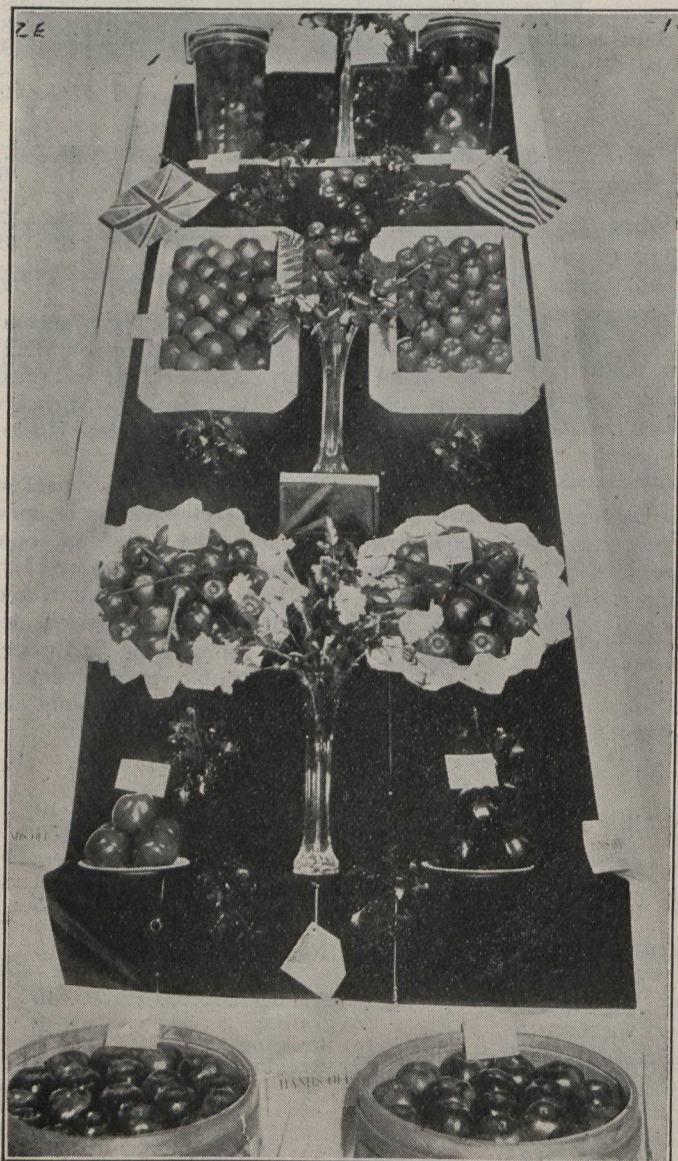


A Part of the Kelowna, British Columbia, Display at the Spokane Apple Show

In this class each exhibitor was allowed 12 x 18 feet of space. Kelowna lost first place to the Wenatchee Valley, Wash., by three points. Mr. DeHart stands on the left and Mr. Gibbs on the right.

To Mr. F. R. E. De Hart the utmost credit is due for his untiring efforts in collecting the exhibit in so short a time and his splendid staging of the fruit at Spokane. So public spirited a man

is a valuable adjunct to a fruit section. Mr. James Gibb, an expert from Stirling and Pitcairn's packing house, accompanied Mr. De Hart and his faultless packing helped to place this city in the lime-light as a fruit-growing centre.



First Prize Collection of Apples at Spokane Show last December
Display of Mr. F. R. E. DeHart, Kelowna, B.C.

Principles of Plant Breeding*

Prof. W. Lochhead, Macdonald College

A GREAT deal of attention is now being given to the improvement of plants by the separation of mutations. The recent studies of De Vries of Holland, of Nilsson of Sweden, of Burbank of California, and of others, have revealed the importance in breeding of variations that appear suddenly, sometimes of such magnitude that they are designated as "sports." As a rule, this kind of variation or mutation is not of frequent occurrence, although the work of Nilsson with cereal crops would lead us to believe that such varieties are to be found in considerable number in every field of grain.

We do not know the causes that bring about these mutations, nor can we produce them at will. A practical difficulty lies in being able to distinguish them from variations of the ordinary sort. The only test is to breed them. Mutations

come true to type and do not show any tendency to revert to the normal or parental type.

It will be gathered, therefore, that "ordinary variations are of value mainly in the production of improved strains of a race which differ only in such characters as high yielding capacity, which are soon lost when the selection is discontinued. Mutations or sports, on the contrary, are of value in the production of distinctly new races and varieties which maintain their new characters without continued selection."—(Webber.)

It must not be inferred, however, that mutations remain absolutely constant and without variation. They, too, are liable to vary within definite limits, so that when a mutation is chosen on account of its desirable and superior qualities, it is necessary for a breeder to keep up a selective process if he wishes to get the best possible plants of the mutation.

"Mutations are found in wild as well as cultivated plants, and their occurrence reasonably accounts for the numerous 'elementary species', or sub-divisions of Linnaeus' species that are found in Nature."

EXAMPLES OF MUTATIONS

Well known examples are the weeping willow and the nectarine, but many other plants are now classed as mutations. Some of the most popular and most high-

*In the June issue of The Canadian Horticulturist, the improvement of plants by selection was discussed. Mutations, herewith dealt with, will be followed by an article on hybridization.