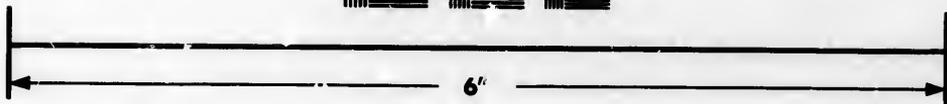
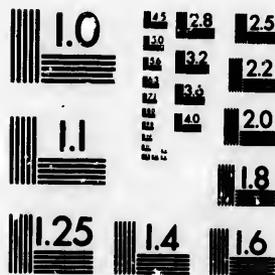


**IMAGE EVALUATION
TEST TARGET (MT-3)**



**Photographic
Sciences
Corporation**

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

18
20
22
24
26
28

**CIHM/ICMH
Microfiche
Series.**

**CIHM/ICMH
Collection de
microfiches.**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

101

© 1983

Technical and Bibliographic Notes/Notes techniques et bibliographiques

The institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- Coloured covers/
Couverture de couleur
- Covers damaged/
Couverture endommagée
- Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée
- Cover title missing/
Le titre de couverture manque
- Coloured maps/
Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur
- Bound with other material/
Relié avec d'autres documents
- Tight binding may cause shadows or distortion along interior margin/
La reliure serrée peut causer de l'ombre ou de la distortion le long de la marge intérieure
- Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- Additional comments:/
Commentaires supplémentaires:

- Coloured pages/
Pages de couleur
- Pages damaged/
Pages endommagées
- Pages restored and/or laminated/
Pages restaurées et/ou pelliculées
- Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées
- Pages detached/
Pages détachées
- Showthrough/
Transparence
- Quality of print varies/
Qualité inégale de l'impression
- Includes supplementary material/
Comprend du matériel supplémentaire
- Only edition available/
Seule édition disponible
- Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image/
Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	14X	18X	22X	26X	30X
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12X	16X	20X	24X	28X	32X

The copy filmed here has been reproduced thanks to the generosity of:

National Library of Canada

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol \rightarrow (meaning "CONTINUED"), or the symbol ∇ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

Bibliothèque nationale du Canada

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole \rightarrow signifie "A SUIVRE", le symbole ∇ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.

alis
du
modifier
une
page

crata
o

elure,
à

II.—On the Influence of Sex on Hybrids Among Fruits.

By WILLIAM SAUNDERS.

(Read May 23, 1883.)

In an early edition of Gray's "Manual of the Botany of the Northern United States," the statement was made that some interesting forms, intermediate between the wild black-cap raspberry (*Rubus occidentalis*) and the common red raspberry (*Rubus strigosus*), had been found growing wild in some parts of the United States. This remark, although subsequently admitted by Dr. Gray to be incorrect, and hence omitted in later editions of the Manual, prompted the work afterwards undertaken by me on varieties of these two species of *Rubus*.

In the spring of 1870, among a number of other attempts at hybridizing, five flowers of the Doolittle Black-cap raspberry, an improved form of *Rubus occidentalis*, were fertilized with pollen of the Philadelphia raspberry, the latter a chance variety of *Rubus strigosus*. There resulted from this experiment five berries, all imperfect as to form, but each containing some well-ripened seeds. These were gathered during the latter part of July, when fully ripe, and sown without delay. In the following spring many of them germinated, and twenty-four healthy plants were obtained. In 1873 these all fruited, some five or six of them proving to be enormously prolific, while many of the others were lacking in fertility, and produced a large proportion of imperfect berries. After a fair trial most of these latter were destroyed.

The fruit of the selected hybrids was somewhat larger than that of either of the parents; in colour it was intermediate between the two, but more closely resembling the Philadelphia than the Black-cap, while the flavor was a striking combination of both.

In conducting this experiment, the point watched with most interest was the manner of propagation. *Occidentalis* propagates by rooting from the pendulous tips of the branches which are sent up every year from the crown of the plant, while *strigosus* sends up suckers from the roots which extend to a considerable distance from the base. In every instance these hybrid plants rooted from the tips, but not freely, after the manner of *occidentalis*, and in two or three instances, during ten years of observation, I have found canes springing from the roots a few inches from the crown, indicating an occasional tendency towards this method of propagation. The multiplication of these plants by the rooting of the tips was attended with so much uncertainty that another method was tried: the canes were layered and covered with three or four inches of soil, when they rooted at almost every joint. In growth they are very vigorous, and their hardiness is shown by the fact that they can be successfully cultivated very far north. In these instances the constitution and habit of the plant seem to have been chiefly influenced by the female, while the fruit is intermediate in character between both parents, but inclining towards that of the male.

Similar, and, perhaps stronger, evidence in this direction can be adduced from experiments on grapes. The Clinton, an improved form of *Vitis cordifolia*, or the frost grape, was

selected as the female, and crossed with Buckland's Sweet-water, a large, greenish-white grape, one of the progeny of *Vitis vinifera* of Europe. The Clinton is a rapid and vigorous grower, and very hardy; it produces a medium-sized bunch, long, narrow, and compact, and often shouldered; the berries are below medium size, round and black. The male, Buckland's Sweet-water, is a less vigorous grower, the berries are large and oval, the bunch is large and loose. The hybrid resulting from this cross resembles the Clinton in its hardiness and vigorous growth, also in the character of its foliage, but the fruit is greenish-white, the berries are oval, and intermediate in size and quality between the parents. The bunch is larger than the Clinton, and much less compact. There is a change also in the form of the seeds, which resemble those of Buckland's Sweet-water.

In another instance the Clinton was crossed with Muscat Hamburgh. This is a high-flavored variety of *Vitis vinifera* grown under glass, with a large oval, black berry, and a loose bunch. Several of the seedlings of this parentage have borne fruit of excellent quality. The berries are oval, larger than Clinton, the bunches loose, and the fruit intermediate in quality between that of the parents. The seeds are quite long, much resembling those of Muscat Hamburgh, while in habit and foliage the vines resemble the Clinton.

A cross between the Clinton and the Syrian, another greenish-white grape of the *Vinifera* class was also effected. The Syrian bears enormous bunches of rather watery and insipid grapes. This hybrid also bears a greenish-white grape, but neither the bunch nor the berry is so much increased in size as might have been expected.

Some crosses were also made between the Clinton and the Muscat Otonelle, a delicious little white grape of the *Vinifera* class, smaller in berry and bunch than the Clinton. These hybrids vary in colour, some being black, others white; the fruit in every instance is improved in quality, but is small in size, while, as in the other instances given, the vines partake largely of the character of the Clinton in growth.

Another series of hybrids was produced by taking the Concord as the female. This grape is related to *Vitis labrusca*, and has thick, leathery leaves, downy on the under side, while the leaves of the varieties of *Vitis vinifera* are smooth and comparatively thin in texture. The fruit of the Concord is large, round and black. All the hybrids resemble the Concord in foliage, but they vary very much in the character of their fruit. Several crosses with a large white grape, known as the Duchess of Buccleugh, produced grapes which were larger than Concord, and which varied in colour on different vines from red to black; most of them were finer in quality than Concord, but require a longer season in which to ripen.

Hybrids between Concord and Delaware, the latter a small red grape, produced in one instance a black grape, in another a dark red one.

A natural seedling, but little in advance of the wild form of *Vitis cordifolia*, which requires some frost to ripen it well, was also selected as a foundation to work on. This was taken as the female, and crossed with the August Muscat (*Muscat d'Aout*), which is a very early red grape, belonging to *Vitis vinifera*. The hybrids bore either red, white, or black fruit, all ripening much earlier than that of the female parent, and intermediate in size and quality betwixt the two.

In gooseberries, among other crosses, one was obtained between the wild prickly gooseberry of our woods, *Ribes cynosbati*, as female, and one of the cultivated English

varieties belonging to *Ribes grossularia*, as male, a large red, hairy berry of good flavor known as the Warrington. Three of these hybrids have fruited. In growth and habit the bushes much resemble the female parent, while the fruit is considerably larger, and improved in quality, and in most instances when ripe, the berries are tinged with red. One variety bears a berry entirely smooth, a second has a few hairs, while the third has bristly hairs, but is not spiny, like the fruit of the female parent.

These and other similar instances which could be cited from the writer's experience, appear to confirm the idea that the influence of the female parent is more strongly expressed in the habit, character of growth and constitution of the vine, bush or tree, while the influence of the male is more distinctly seen in the form, colour and quality of the fruit; and in the case of hybrid grapes, in the size and form of the seeds also.

