

MONDAY AFTERNOON POPULAR LECTURES.—HOW TO COLLECT AND PRESERVE BOTANICAL SPECIMENS.

BY JAMES M. MACOUN.

(Delivered February 3rd, 1890.)

Until a collector has become fairly well acquainted with a collecting ground he should not attempt the collection of both phænogams and cryptogams at the same time. It is much better to make two expeditions to one locality, collecting flowering plants the first day and mosses, lichens, fungi, etc., on the occasion of a second visit. To do good work with cryptogams it seems necessary to focus the eye especially for them and even the most experienced collectors find it impossible to collect them in a satisfactory manner unless they render themselves practically incapable of seeing a flowering plant at all. As most of you however confine your attention to flowering plants, let us imagine that we are about to set out in search of them. It will be necessary to take out with us nothing but a strong knife and a plant press or vasculum. Except where plants are desired for study or are very tender and require peculiar care in drying, I know of no reason why the vasculum should ever be carried by one who is collecting specimens for preservation, although it will always be preferred by some, and much can be said by them in its favour. Apart from the claims that either party may offer, as regards the superior beauty and quality of specimens that have been collected in the one way over those collected in the other, the one argument that to me seems convincing is that if the press be used in the field the specimen is secured beyond a doubt, while this is by no means certain if the vasculum be employed. Assuming that care has been exercised in the arrangement of specimens in the vasculum, and that the collector has reached home with the results of his day's work in good order, there is still the mechanical and less interesting part of the work to be done—the transfer of the specimens to whatever form of press is used—not infrequently one is too tired to do this at night, and it is postponed until the following morning, when too often one is so hurried that the work cannot be done properly, or perhaps not at all, the bare possibility of this happening is sufficient in my opinion to warrant the disuse of the vasculum altogether by collectors of *specimens*

for the herbarium, as without doubt many fine and rare specimens are lost or spoilt simply because they are neglected after they have been collected.

My plan, as soon as the collecting ground has been reached, is to lay the press on the ground or against a stump or tree, and to collect the plants found in the immediate vicinity: when as many as can be conveniently carried in the hand have been gathered, they are taken to the press, the specimens most worthy of preservation are selected and placed between driers, and the others thrown away. It is important that not only the flower, and where possible the fruit, be collected, but the root also. It may be said that large roots often disarrange the press and the specimens it contains, but there is no need of this. I know of no plant, the root of which may not, with a little trouble, be cut down, so that while its structure may be shown, it will not interfere with the proper drying of the other specimens in the same press. The cutting should all be made from one side, and in the case of bulbous and tuberous plants, or those with tap roots, everything beneath the skin should be carefully cut away, and the specimen will for all herbarium purposes answer as well as if the entire bulb, tuber, or root had been preserved. When using a plant press in the field, no care need be exercised in placing specimens between the driers; much time is often wasted in the endeavor to make specimens remain in just the position that seems best to the collector. If they are placed in the press in the most haphazard manner and submitted to moderate pressure it will be found that after a few hours they will become limp—not withered—and may then be arranged to suit any taste; when put under greater pressure the lines where leaves and blossoms have been bent will disappear. After a day's collecting it is by no means necessary that the plants should at once be transferred to the home press, although the sooner this is done the better, for it should not be forgotten that as soon as driers become saturated, their usefulness is gone. At home a screw or lever press may be used, but a piece of broad board and two or three stones of various weights will answer much better. It is a mistake to use too great pressure, all that is required, is that all parts of the specimen come in contact with the driers, and that the weight be sufficient to prevent wrinkling. What the weight should be depends upon the number

of sheets under pressure. The driers between which specimens have been placed should be changed at least twice a day, until the plants are almost dry, and care should be taken that the papers used for driers should be quite free from moisture; this is best effected by spreading them out where the sun's rays will fall directly upon them, or by placing them in an oven or upon a stove. If specimens are to be dried quickly, two sets of driers should be used and changed every half hour, the driers not in use having in the meantime been thoroughly dried and heated; or the specimens may be placed between thick sheets of blotting paper and dried in a few minutes by means of a hot flat-iron; or after the specimens have been in the press for one day they may be placed between two driers and exposed to the sun. Some species lose their original colour if dried in any of these ways, but their number is small and experience soon teaches one what they are; they are however apt to become brittle, but this difficulty may be obviated with a little care. The specimens should not be made quite dry, but only almost so, and then placed under light pressure for a few hours. Many plants such as the Sedums or Stonecrops, the Cacti, nearly all Orchids and some others are difficult to dry if ordinary methods be employed; they may, however, be made ready for the herbarium in a few hours by simply dipping them in boiling water a sufficient number of times to quite kill them; there is nothing then to be done but to press out the moisture they contain. By this means all plants of a succulent nature are most easily dried.

Potamogetons and kindred water-plants should be placed between masses of paper as soon as taken from the water, and while still wet pressed a little and then transferred to the ordinary driers which need not again be changed.

Vascular Cryptogams such as ferns, equisetums, and club-mosses are collected with flowering plants, as they are of about the same size and dried in much the same manner.

In collecting mosses, lichens, fungi and liver-worts, the vasculum, a basket or even a canvas bag, or large handkerchief may be used; with the exception of fungi all are best when collected shortly after rain has fallen, and are then, too, procured most easily. With the exception of fungi the method of drying all is the same, and is very

simple. Secure fruiting specimens when possible, and after cutting off as much bark, dirt, or rotten wood as is advisable from them, place them between driers, press them slightly and then expose them to the sun until nearly dry, or leave them in a loosely fastened press placed in a small room. Fungi are difficult to dry properly, they should as a general rule be placed gills upward in the sun and will dry in that way in a day or two, but many of them cannot be treated in this way, nor indeed preserved at all.

With all forms of plants the collector should select the best specimens that are to be had when a plant is first seen, and if better are found later on, one should not hesitate to replace, with them, those already collected. While the selection of good specimens in the field is the first important point, care in preserving and drying them is what makes good herbarium specimens. The work in the field may be the most interesting, but it amounts to little more than a health-giving pastime unless the results of the work be preserved in a proper manner.

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LIST OF MOSSES COLLECTED IN THE NEIGHBORHOOD OF OTTAWA.

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(Continued from Vol. II, page 272.)

Since the publication of the list of mosses in Vol. II of the Transactions of the Ottawa Field-Naturalists' Club, I have collected the following species :

124. *Sphagnum rubellum*, Wils.—Mer Bleue (Oct., 1889).

125. *Sphagnum cuspidatum*, Ehrh.—Mer Bleue (Oct., 1889.)

126. *Sphagnum intermedium*, Hoffm.—In wet woods north of Beechwood, Ottawa (Oct., 1889).

127. *Sphagnum squarrosum*, Pers.—Quite common in little ponds and wet spots north of Beechwood, Ottawa (Oct., 1889).

128. *Ephemerum serratum*, Hampe, *var. angustifolium*, Schimp.—Not uncommon on overflowed ground at Hull Cemetery and Leamy's Lake (Oct., 1889).



Macoun, James Melville. 1890. "How to Collect and Preserve Botanical Specimens." *The Ottawa naturalist* 3(4), 146–149.

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