GENERAL NOTES ON PLANT COLLECTING

Pressing plant materials requires careful attention to detail if quality specimens are to result. In the first place, it is necessary to select specimens judiciously, and in this regard the following points should be observed:

- Select specimens that are free from evidence of insect feeding, rust infections, and other ordinary pathological symptoms.
- Ordinarily avoid the depauperate individuals.
- Ensure that the specimen is either in flowering or fruiting condition. Sterile material is generally worthless.
- If the specimen is herbaceous, always include enough of the underground parts to show their character.

Arrangement of the specimen within the pressing paper is an important step in preparing herbarium specimens. When the specimen is fresh, its parts are usually pliant and can be arranged easily. Skill in specimen arrangement comes with experience, and many collectors take justifiable pride in their work. There are many aspects of plant pressing that are learned best from experience and by working with collectors of experience. However, the following items are offered as suggestions to the inexperienced:

- Greatest efficiency is obtained from the pressing paper and press only when the maximum surface of the paper is covered by the specimen or specimens.
- Ordinarily, a specimen should be restricted to a single folded sheet of pressing paper; some large-foliaged materials are exceptions.
- When individual plants are very small, many of the same kind and from the same collecting site may be pressed in a single pressing paper.
- Herbaceous specimens longer than 16 inches may be accommodated by folding in a V-shaped or N-shaped manner.
- Avoid breaking brittle stems at point of fold by means of moderate maceration at the fold before bending.
- Springy stems may be held in place after folding by slipping slitted slips of paper over the bent ends.
- Prune specimens judiciously to prevent appreciable overlapping of parts, but always leave a basal portion (petiole segment of flower pedicel) to indicate location of pruned part.
- Whenever possible, arrange one or more leaves (or parts of leaves) with lower side uppermost.
- When leaves are pinnately compound, it may be necessary to excise all except one leaf. If the remaining leaf is too large for the sheet, it may be split lengthwise (or the leaflets removed from one side) providing the terminal leaflet (when present) remains attached and is not mutilated.
- Large palmately compound leaves usually may be split in half lengthwise and one half discarded.
- Very large tall herbs may be split lengthwise along the stem (leaving the inflorescence intact or not) and one half discarded. Another choice is to press a section from the bottom, another

from the middle, and a third from the top; indicating this in the notations and giving each segment the same collection number.

- In some plants, only a single leaf and the inflorescence may be accommodated within the sheet. Always note the leaf arrangement I such cases and include the entire petiole and a portion of the stem from which it was produced.
- Plants with enclosed flowers should have a few flowers pressed separately and some of these split open and spread out before pressing.
- All roots, or other underground parts, should be washed free of soil before pressing whenever possible.

Drying techniques are of two types: those accomplished without heat, and those with the aid of artificial heat.

- Drying without heat was universal until about the advent of the present century. The procedure is somewhat as follows. Plants are placed in pressing papers between the blotters of a conventional field press. No corrugates are employed. The press is "locked up" for about 24 hours; this is known as the sweating period. It is then opened, and as blotters are removed each pressing sheet is turned back, the specimen examined, and parts rearranged as the situation demands. This rearranging is an important step, for at this time the parts of most plants are somewhat flaccid and have lost their natural spring, and it is a simple matter to place the parts of the plant in the position desired. The quality of the final specimen will be determined by the care given to the rearrangement of the plant. After rearranging, the folded sheet is lifted onto a fresh dry blotter and covered by another dry blotter. This is repeated fro every specimen until all have been examined, rearranged as necessary, and placed between dry blotters. The new pile of blotters and the specimens are then locked up in the press and allowed to stand for another 24-36 hours, when the process of replacing wet (or damp) blotters with dry ones is repeated. A third change of blotters follows, and the length of time between this and the previous change, will be determined, in part, by the kind of material being dried, but ordinarily it is after 2-3 days. Except for fleshy succulent material, which may require much longer time, most specimens are completely cured by this technique in about a week.
- Drying with the aid of artificial heat is the prevalent method. It is accomplished by means of heated dry air passing up and through the ducts of the corrugated sheet. The efficiency of the method depends entirely on the presence of open ducts throughout the entire sheet of corrugated material. Every closed duct impairs the quality of the specimen. The basic procedures to be followed for this method of drying are:
    - Specimens are sweated in the field press for about 24 hours. They are then opened, examined individually, rearranged, and each sheet transferred to the drying press. The drying press is locked up with less pressure then that exerted on the plants when in the field press, and the press is placed over the heat source. The press is tightened after 6 hours of drying, tightened again after 12 hours and at the same time is turned over so that the cool side faces the heat. After 24 hours the press is removed from the heat source, opened, and all folders of dry specimens removed; drying is continued for the wet specimens.

- The total time over the heat will vary with the intensity of the heat source, from the minimum of 12 hours (considered too rapid drying by most collectors) to a day and a half or two days. The choice of heat source will depend on the situation.

DIRECTIONS FOR COLLECTING PLANTS

A dried plant specimen placed in the herbarium of a university or museum may remain there for one hundred years or more and be examined by many botanists. If it is not good to begin with, nothing much can be done to make it better later. In collecting and preserving specimens it pays to start right. Even if the work is done only as a class exercise, and the specimen is not intended as a part of a permanent collection, the technique employed should be good. Collections left by students when a course is completed are sometimes sent to other herbaria in exchange for plants from other localities. It frequently happens that even an inexperienced student, without knowing it at the time, finds a plant which is particularly valuable for one reason or another. It is important that the specimen which he collects be a good one. Then there is a definite satisfaction in knowing that you have done a piece of work well.

FIELD EQUIPMENT

When you go on a collecting trip, take with you a plant press for the specimens to be dried, a plastic bag for specimens to be preserved for dissection, a small notebook, and a knife. A trowel or small screwdriver, or some other tool for digging, should also be available. Two or more students may find it convenient to go into partnership in providing and carrying the equipment.

The plant press should be provided with six to twelve or more gray blotters and a good supply of newspaper folders. The latter must be neatly folded and of uniform size – about 12 inches wide, when folded, and not over 16 inches long. Waxed paper of the kind sold by grocery stores and used for wrapping sandwiches is satisfactory. The knife should be sharp and strong enough to cut twigs as large as a pencil.

SELECTING THE SPECIMEN

Look for a plant which is healthy and undamaged and which represents the species well. Whenever possible get the entire plant. Even if it is 3 or 4 feet tall, it may be bent into a V or an N and accommodated in the press. In the case of trees or other large plants judgment must be used as to how much to include; the specimen should be as large as possible, and it must be neatly cut, not broken, from the plant.

Roots should sometimes be included. At other times they are less important and may be omitted. If rhizomes or runners are present they should be included. Look closely to determine whether the plant is annual, biennial, or perennial, and include the evidence or a note about it. The specimen collected should usually be in flower. Fully developed fruits, especially if they are dry, are often necessary for identification and should always be collected if present. If the plant is tall, the leaves on the upper part of the stem may be different from those at the base in size or shape. Both should be included in the specimen.

Thick roots or stems or other parts which will not press flat can sometimes be improved by splitting them and pressing only half. Cacti and other succulents which dry slowly often call for special treatment. Directions will be given as needed.

In addition to the specimen placed in the press, there should ordinarily be one for dissection in the laboratory. It is wrapped in waxed paper, placed in the metal box, and kept in the refrigerator until needed. This specimen should be as small as practicable – a few flowers and possibly some small fruits. Each collection should be wrapped separately. To identify the plant in the laboratory you will use this fresh specimen and the corresponding pressed, one together.

PLACING THE PLANT IN THE PRESS

Open the press and lay one half – the half with the straps attached – on the ground. Place on this a blotter and a newspaper folder. Open the folder and place the plant inside arranging the leaves and flowers so that they will not be crushed more than necessary. Cover the folder with a blotter, add the next folder and plant, etc. Follow the last folder with a blotter and the remainder of the supply of blotters and folders, then place the other half of the press in position and fasten the straps.

All parts of the specimen must be included within the folder. Leaves, flowers, or roots extending beyond the blotters will soon dry and become damaged.

After the first plants pressed have wilted, the blotters can be removed from between the folders and used again. To collect a large number of plants on any one trip it is necessary to carry only a few blotters. Each newspaper folder should, however, contain only a single collection; that is, only one species collected in one place. If you collect the same species in more than one place, keep the collections separate.

FIELD NOTES

When you begin collecting, start an accession list in your field notebook. Give each collection an accession number, and continue the list throughout the course. If some specimens are later thrown away, do not use their numbers again.

In your notebook record the date and place of each collection and add observations on soil, moisture, light, etc. Since plants frequently occur in characteristic associations, the names of other plants growing in the same place are important. These notes should improve as you gain experience. It is obvious that if you collect several plants in one definite habitat, a single set of notes on habit will suffice for all. Notes should, of course, be made on the individual collections when information supplementary to that afforded by the specimen seems desirable. The notes on place of collection must be as definite as possible, so that the place can later be found by anyone wishing to learn more about the plant. State distances accurately, and locate with reference to landmarks which are likely to be permanent.

Place with each plant an accession number corresponding to that in your notebook. This may be written on a small tag attached to the plant or placed in the folder with it. Do not write the number on the margin of the folder containing the plant. These folders are often used repeatedly,

and to depend upon numbers written on them is to invite endless confusion. The plant kept for dissection should also bear the accession number, so written that it can be read without opening the package.

DRYING THE SPECIMENS

Plants placed in the press as already indicated may be kept in for a day or two before they are placed in the drier. To prepare them for drying, open the press and, starting with a blotter, build a pile consisting of the folders of plants alternating with drying units each consisting of a blotter and a corrugated drier. As the folders are assembled, each is opened and the plant is straightened and arranged so that the parts show to advantage. Cover the last plant folder with a blotter, put the press together, and draw the straps tight. Extreme pressure, enough to bend or break the sides of the press, is neither necessary nor desirable. Place the press in the drier in such position that the warm air can rise through the corrugations.

THE PERMANENT LABEL

When the specimen is dried and ready to be stored a permanent label is placed with it. These labels are written on slips of plain white paper of uniform size – about 2 x 5 inches. Do not use cards for these labels. The label should bear the following: (1) the scientific name of the plant, correctly written and including the author's name; (2) the common name, if the plant has one; (3) the name of the family; (4) the place of collection; (5) the ecological conditions or associations; (6) the date of the collection; and (7) the name of the collector. For convenience of reference it is also well to indicate on the label the page in the Manual on which the plant is described.

FIELD NOTES

Field notes are just as important as the specimen itself. In many herbaria 50% of the specimens are worthless for research purposes because of inadequate field notes on the specimen label.

Field notes should be recorded at the time of collection and no information should be left to memory. Perhaps the most suitable way to record data is into a ledger-notebook; however, many collectors use a printed data sheet which is inserted with the collected specimen.

There are eight categories of data essential to complete field data. These are as follows:

- NUMBER OF PLANT. Use a straight serial number following the collector's name. A collector should never repeat serial numbers. (Examples: Brown 3246 or Brown 1966/3246).
- NAME OF PLANT. As far as known. Also record native common names, when possible.
- PROVINCE. This is to include the country as well as the major division of the country. (Examples: Brazil, State Minas Gerais or Canada, Province Nova Scotia, County Guysborough).
- LOCALITY. Be precise using a locality shown on an easily available map. Remember place names change with time. The best location is given by grid references or a dot map label.
- ALTITUDE. Preferably in meters. Give the precise altitude at which the collection is made.
- HABITAT. This should indicate the type of terrain and if possible an indication of the community structure. (Example: Limestone bluff among Hemlocks).
- OBSERVATIONS. This should include helpful data such as flower color, population density, pollinators, etc.
- DATE OF COLLECTION. Use the full date in the European style. (Example: 14 Jan 1966. Do not simply use 4/5/66. To some this indicates April 5, 1966, to others May 4, 1966).

Remember this is the minimum data you should strive for. Many other items such as economic importance may be helpful to the person working with your specimens years from now.