potted 1-2″ deep in the growing medium (peat & sand, peat — perlite or whole-fiber sphagnum) and they will readily send up new shoots. The brittle roots will soon fill the pot, and new divisions can be made.

The more typical method of propagating sundews vegetatively is by leaf cuttings. With the short-leaved types, such as the North American species *D. intermedia, D. rotundifolia, D.* x *anglica,* the whole leaf can be cut off at the base of the petiole near the stem, and the whole leaf can then be pressed onto the surface of moist, finely milled sphagnum and kept cool and shady. Be careful to keep the leaf flat against the sphagnum surface; it may require re-pressing regularly for the first few days. The long-leaved sundews, such as *D. filiformis* and *D. binata* may be done by cutting a mature leaf (the portion where the sticky glands are produced) into 1-2″ segments with a sharp razor blade, and pressing the segments onto moist sphagnum as above. I have done this twice with *D. filiformis filiformis* and both times it took exactly 6 weeks to the day for the first little buds to appear all along the margins of the leaf cuttings. The conditions were in the greenhouse, in the fall, part shade and 70°F. There is no need to use rooting hormone, although you can experiment to see if it speeds up the rooting time or produces more plantlets. After the plantlets produce new leaves 1-2″ long, they may be separated and potted up as the parent leaf cutting should have rotted by then. Not every bud will grow to maturity, but you will still have plenty of new plants. Fungus infection may also be a problem here; try and keep a little air circulating in your propagation container.

Finally, the hybernacula (over-wintering buds) of the temperate sundews that form them may produce several buds as they grow older from year to year. These hyberacula may be carefully divided in the early spring before growth commences and repotted in the same or individual pots.

Review of Recent Literature

Adams, Richard M. II, 1978. *Cephalotus follicularis*: The Australian pitcher plant. Am. Horticulturist 57:4-5.

A brief but good descriptive article and with horticultural instructions. Two photos, one of which is unfortunately printed upside down.

Bamforth, S., Rhizosphere-soil microbial comparisons in sub-tropical forests of southeastern Louisiana. Trans Am. Microsc. Soc. 95(4):613-621 (1976).

Bacteria, protozoa and fungi were studies from rhizospheres and nearby soils from *Sarracenia* sp. and 15 other plants.

Bradshaw, W., Lounibos, L. P., Evolution of dormancy and its photoperiodic control in pitcher-plant mosquitoes. Evolution 31(3):546-567 (1977).

The authors studied the two mosquito species, *Wyeomyia haynei W. smithii,* in *Sarracenia purpurea* over its entire range in the U.S. Despite the diapause in different stages of dormancy, the critical photoperiod mediating its onset and maintenance varies continuously, one hour for each increase of 5.4°N latitude or 769 meters of altitude. The ratio of these parameters, 142 meters per degree north permits calculation of an equivalent latitude for any locality. The direction of evolution of dormancy proceeded from south to north and has taken place via the progressive influence of photoperiod on the prediapause instar.

Cameron, C. J., Donald, G. L., and Paterson, C. G., Oxygen-fauna relationships

in the pitcher plant *Sarracenia purpurea* L. with reference to the chironomid. *Metriocnemus knabi* Coq. Can J. Zool. 55(12):2018-2023 (1977).

A dissolved oxygen concentration in excess of 77% saturation was measured inside the fluid of the CP pitcher. The source of this oxygen is mainly from diffusion through the wall of the pitcher and is not affected by plant photosynthesis. Thus, the organism, *M. knabi,* adapted to high oxygen concentration is able to survive in this envioronment.

Komiya, S., Shibata, C. Distribution of the Droseraceae in Japan. Bull. Nippon Dental Univ. 7:3-39 (1978).

This report is a well-documented treatment of the distribution of *Aldrovanda* and eight *Drosera* species in Japan with maps and references.

Menage, R. H. 1975. Growing Exotic Plants Indoors. Henry Regnery Co., Chicago. x + 137 pp.

Pages 57-77 contain a fairly good discussion of CP culture in this generally overlooked paperback book. The author presents a brief but interesting introduction to CP, their habits, the nature of the digestive process, and their general cultural requirements. He then goes into somewhat more detail for each family of CP, although he does not attempt to be complete in listing or describing all the common species of any genus. His suggestions seem to be fairly appropriate, compared with other books of this type. I found only two important shortcomings; one is that he makes the statement that "ordinary fertilizers are absorbed by the roots in the normal way," meaning that you don't have to feed them. We know that while this may be OK for *Nepenthes, Sarracenia* are harmed by fertilizing the roots. He also fails to mention the need for winter dormancy in many species of CP (TLM)

Pant, D. D., Bhatnagar, Morphological studies in *Nepenthes.* Phytomorphology 27(1):13-34 (1977).

The authors study the details of the cuticle and epidermis of shoots and pitchers of *N. khasiana, N. gracilis, N. ampullaria* and *N. rafflesiana.* The lunate cells are a kind of deformed or specialized stomata. The pitcher is formed by the peltate portions of the leaf. An unidentified parasitic fungus was found inside the pitchers. The authors surmised that this genus apparently evolved from the Ranunculaceae or Berberidaceae.

Schnell, Donald. 1978. *Sarracenia flava* L.: Infraspecific variation in eastern North Carolina. Castanea 43:1-20.

Five infraspecific venation pattern and color variants of *S. flava* are herein recognized, briefly described and illustrated. Hybridization among the five basic forms has resulted in a spectral field picture that has confused some observers. Various observations and analyses presented indicate that the variations are non-adaptive, and there follows a broad comment on evolutionary relationships. Pollination mechanisms are also reviewed and described. (Reprints: D. E. Schnell, Rt. 4, Box 275B, Statesville, NC 28677).

Shetler, Stanwyn G. 1974. "Nepenthales" and "Sarraceniales" *In* The Encyclopedia Britannica, 15th Edition.

These two very scholarly articles summarize well a great deal of information on these groups of CP: Nepenthales includes Nepenthaceae and Droseraceae; Sarraceniales includes Sarraceniaceae. In addition to general characteristics, distribution, reproduction, trapping mechanisms, and specialized forms, there is an up-to-date summary of ideas on the evolutionary relationships and classification of the two groups in relation to one another. There are also some good line drawings. Reprints are available by writing Stanwyn G. Shetler, Dept. of Botany, NHB #166, Smithsonian Institution, Washington, D.C. 20560. (TLM)

Smorsten, S. Some Carnivorous Plants and their mechanisms. Pacific Hort. 39: 27-

31 (1978).
This article is a short review of the various mechanisms used by carnivorous plants to trap their prey. The author describes in detail an example of each type of mechanism using a particular species of plant. The article is well-written and ends on some horticultural advice that beginners can use to grow plants in their own collection.

Tallman, O. 1978 (July). Profile on sundews. Ladies Circle House Plants and Indoor Gardening Guide, No. 4. pp. 44-53.
A popular article on Droseras, describing general features of the genus along with details of some representative species and cultural suggestions. Many fine black and white and color photos. On pages 50 and 51, the legends for *Drosera binata* and *Drosera capensis* are transposed.

WANT ADS

When submitting Want Ads, please be sure to print clearly for best results and to eliminate mistakes. Please indicate the correct letter before each item (Want, Trade, Sell or Buy). Want ads are limited to carnivorous plants, terrariums, greenhouses and moss. There is a charge of ten cents per item, with no limit to the number of items you may submit per issue. Send coin or check (payable to Arboretum - CSUF Foundation) to:

Arboretum, Want Ads
California State University
Fullerton, CA 92634

Orgel C. Bramblett, 18950 SW 136th St., Miami, FL 33157. (S) Fresh Nepenthes khasiana seed.

Joseph P. Cantasano, 2717 Jerusalem Ave., N. Bellmore, NY 11710. Wants to trade ampullaria rosette for N. hookeriana or any hybrids of Nepenthes.

Scott Cumming, 45 Willow Ave., Cornwall, NY 12518. (TB) Plants or seeds: Drosera schizandra, D. linearis, D. anglica, D. adelae, Byblis gigantea, Drosophyllum, Pinguicula caudata, P. primuliflora, Sarracenia oreophila, Heliamphora. (TS) Plants: Drosera binata, D. capensis, D. capensis narrow-leaf, D. x nagamoto. (TS) Small plants: Drosera binata var. multifida, D. binata var. dichotoma, D. rotundifolia, D. x californica, D. filiformis

Bruce Dudley, 51 Dogwood Dr., Weaverville, NC 28787. (S) Utricularia longifolia (small plantlets). (B) Heliamphora (plants, seedlings), Nepenthes (plants, cuttings, seedlings), tuberous Drosera (plants), Sarracenia psittacina x purpurea (courtii) (plants, cuttings, seeds), S. leucophylla x formosa (plants), S. courtii x melanorhoda (plants), Byblis gigantea (plants), D. linearis (cuttings, seeds), D. anglica x capensis (plants).

Ron Fleming, P.O. Box 3834, Kenai, AK 99611. (W) N. x mizuho, N. x mixta, N. x princeps, N. x tiveyi, N. x edinensis, N. x formosa. (T) P. villosa, enquire.

Jacques Haldi, 9, chemin des Pontets, 1212 Grand, Lancy, Geneva, Switzerland. (WB) Two plants Sarracenia oreophila or rhizome.

Garry Nolan, 20 Stratford Court, Windsor, CT 06095. (TS) Plants of: Drosera filiformis tracyi, D. x nagamoto, D. indica, D. burkeana, D. burmanii, D. montana, D. binata hybrid, D. intermedia, Dionaea muscipula, Utricularia subulata, nine-month old seedlings of Sarracenia rubra ssp. jonesii. (WT) Plants for rooted cuttings: N. ampullaria, N. rafflesiana, N. alata, N. hookeriana, Drosera pusilla, D. regia, D. petiolaris, D. trinervia, D. schizandra.

Cliff Owens, 717 SE 16th St., Ft. Lauderdale, FL 33316. (B) S. flava x purpurea, S. leucophylla x purpurea, S. minor x purpurea. (BT) D. schizandra seed or plant, D. binata seed or plant, D. regia seed or plant, D. binata multifida seed or plant. D. capillaris and D. filiformis v. tracyi to trade for other species.

Steve Smith, RD #1 Box 296, Kirkwood, NY 13795. (WTB) Nepenthes rafflesiana plant, Nepenthes gracilis plant.