that were left did show their tall and stately appearance as compared to their shorter cousins outside the swamp. It was interesting that the "Okee Giant" *S. minors* were going dormant and yet most of the shorter *S. minor* were still in flower and many were actively growing. I also found lots of *S. psittacina* which were still in bloom.

Well, by now it was now raining, and I had donated enough blood to the mosquitoes, so I headed for home. I regretted that I didn't get the chance to view some other areas where other species of *Sarracenia* and *D. filiformis* grew. Hopefully, in the spring I'll have more time to do this. It was good to return to areas where not much has changed and many small stands of CP are surviving.

Looking back on my trip, I noted that the *S. minor, S. psittacina, Drosera capillaris*, and *D. intermedia* were all flowering but neither the Pinguiculas nor *S. flava* were in bloom. Utricularias were in bloom everywhere, sometimes just filling a drainage ditch or wet fields with flowers. Although most of the plants seemed to be actively growing, several weeks later we had some cool weather here, and judging from the CP in the Jacksonville area, that cool spell finally sent them on their way to dormancy. And with that, this field trip comes to an end with bites and wet feet — at least until spring.

Pinguicula in Folkston, GA
Photo by Gary De Puy

Review of Recent Literature

Aldenius, J., et. al. 1983. Effects of insect trapping on growth and nutrient content of *Pinguicula vulgaris* L. in relation to the nutrient content of the substrate. New Phytol. 93: 53-59.

Plants fed insects or given soil nutrients or both in controlled enviroments grew larger and had greater dry weight. A single "dipterid" insect was applied to one leaf of each test plant in the series, and those plants so fed seemed better able to take up nutrients applied in the soil, suggesting some other component absorbed from the insect that seemed to increase root absorption efficiency. *(Ed. comment – It would seem that these results can only be related to the experimental environment since in nature many insects of diverse kind and over a period of time are trapped by a plant.)* (DES)

Broussaud, F., and C. Vintejoux. 1982. Etudes ultrastructurales et cytotechniques de tissue superficiels places a l'entree des urnes d'*Utricularia* (Lentibulariaceae). Bull. Soc. Fr., 129, lettres bot., 191-201.

IN FRENCH

Examination of the utricle entrance of Utricularias by ultrastructural and cyto-

chemical techniques disclosed different zones whose characteristics have been described. The outer portions produced long wall expansions with superposed lipid and polysaccharidic substances that seem to play a role in the mechanism of the trap. (DES)

Kaul, R.B., Am. J. Bot. 69(5): 793-803. 1982. Floral and fruit morphology of Nepenthes lowii and N. villosa, montane carnivores of Borneo.
The floral nectar glands are similar in structure to nectar glands and digestive glands of pitchers. Only 4.5% of the seeds in the sample bore embryos and fertile seeds lack endosperm. There is more need for field observations on pollination.

Lerner, Carol. 1983. Pitcher plants. William Morrow & Co., Inc., 105 Madison ave., New York 10016. 64 pp. $11.00.
This superb little book is officially designated as a children's book, but should be in every CP enthusiast's library. The author-illustrator is experienced in botanical illustration and there are multiple line drawings as well as full color watercolors of each of the species of *Sarracenia* and *Darlingtonia*. The line drawings also cover basic morphology and the various insect parasites. The text is very clearly and accurately written and includes a surprising amount of information in the 64 pages. The book is more than worth the price for the illustrations alone. Conservation is emphasized throughout, but not in a boorish or pedantic way. The book also has a list of gardens where growing plants may be observed. (DES)

Mellichamp, T.L. Cobras of the Pacific Northwest. Nat. History 92: 46-50. 1983.
This article describes the history of discovery, the name Darlingtonia, and the type of area where these plants can be found growing. The author also discusses the relationships to other CP and the geological and ancestral history of its origin on the West Coast of the U.S. Beautiful photographs taken by Makoto Honda of the plants in their natural environment grace this article.

New Scientist, July 1, 1982. Plant thieves threaten rare species.
This magazine article relates an interesting incident regarding an upsurge in thefts of rare and endangered plants which the Nature Conservancy Council is looking at with some alarm. It seems that in Britain a warden of a nature reserve discovered someone digging up a sundew (Drosera anglica). The man admitted to being a member of the Carnivorous Plant Society and was made to replace the plant. The British Society condemned the theft and added that the plants were commercially available. At last report, the NCC has decided not to prosecute the man under the Wild Creatures and Wild Plants Act of 1975, but Friends of the Earth is considering legal action. The penalty for uprooting a sundew or orchid is a fine up to $150 for each specimen taken. Some rarer plants like the lizard orchid can bring a fine of $750 per plant! Beware!

Peng, C. and Kenton, A., Ann. Missouri Bot. Gard. 69:418-419. 1982. Chromosome number of *Byblis liniflora* Salisb. (Byblidaceae).
The authors report a 2n = 18 for B. gigantea and 2n = 32 for B. liniflora. The latter number of chromosomes differ from a report by K. Kondo which reported a 2n = 24. This difference may be due to the sticky ends which would cause aggregation. The "long" chromosomes that Kondo showed in his drawings were absent in the present authors' pictures and the lower count could be due to aggregates.

Rea, Philip A. 1982. Fluid composition and factors that elicit secretion by the trap lobes of *Dionaea muscipula* Ellis. Z. Pflan-

zenphysiol. Bd. 108. S. 255-272.
The acid secretion is found to be HCl. Stimulation of secretion is effected by a wide range of ions, including many low molecular weight nitrogen compounds and even several alkali metal salts. Salt-free protein suspensions were found to be inactive and it is postulated that Darwin's experiments with ovalbumin and Venus' flytrap secretions worked because of salt contamination of the protein; pure ovalbumin did not work for this author. Some other cations are also secreted along with H^+, but in extremely small amounts.

Rea, Philip A. 1983. The dynamics of H^+ efflux from the trap lobes of *Dionaea muscipula* Ellis (Venus' flytrap). Plant, Cell and Environment 6: 125-134.
Hydrogen ion efflux from trap lobes of *Dionaea* was increased by FC, IAA and 2,4-D, and suppressed by ABA and DES. Also, potassium, ammonium ions and urea caused efflux of a rapid as well as prolonged character. The mechanism of these agents is hypothesized in physiologic terms in the paper. (DES)

Steffan, W. A., Kodani A. and Evenhuis, N., Mos.Q. Syst. 14(1): 11-13. 1982. *Toxorhynchites nepenthicola,* new species from Papua, New Guinea (*Diptera*: *Cullicidae*).
The above new species was described. The adults were bred from larvae collected in Nepenthes pitchers in the upper Fly River area of New Guinea.

Watson, A.P., Matthiessen, J.N. and Springett, B.P., Aust. J. Ecol. 7(1): 13-22. 1982. Arthropod associates and macronutrient status of the red-ink sundew *(Drosera erythrorhiza).*
The authors studied the above plant in a bushland site of Spearwood Dunes System near Perth, Australia. An insect new to the area was found to supply 100% of the nitrogen and phosphorus to the nutrient pool of the plant. The soil supplied sufficient potassium to the plant. Other insects were found that could be called "opportunistic predators" because they scavenge captured prey items.

Book Review –

Flora of Australia, Volume 8

by P.S. Lavarack (Queensland National Park, Pallarendo, Townsville, Australia)

Australia is one of the world centers of carnivorous plants and, in particular, of the genus *Drosera.* Australia has 54 species of *Drosera* out of a world total of about 100. Since this genus becme popular in horticulture a few years ago, there has considerable confusion over the taxonomic status of many of the Australian plants. Late in 1982 a book was published which sheds a considerable amount of light on this topic. This is Volume 8 of the new series *Flora of Australia*. This series which will run to some 49 volumes and will take 20 years to complete will provide the first complete study of the flora of the Australian continent since Bentham's *Flora Australiensis* published between 1863 and 1878. It is a massive undertaking and will eventually include contributions by hundreds of botanists. Volume 8 is, in fact, the third volume to be published–the numbering is in systematic sequence, but the volumes are published according to the availability of suitable authors and other factors. The first volume contains an introduction and a series of essays on the Australian flora, Volume 29 includes the family Solanaceae, and Volume 8 contains 19 families among which are Nepenthaceae and Droseraceae. In all, the volume consists of 420 pages of which the two carnivorous families contribute 62 pages.

Other families covered in this volume include Lecythidaceae, Flacourtiaceae, Bix-