

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

The following paper by Professor Zufall is a continuation of the discussion on *Materia Medica* which appeared in the last issue of the JOURNAL.

The address of Dean Rudd, appearing in the *Purdue Pharmacist*, deserves, I believe, a wider circulation because of the many helpful things for students of pharmacy contained therein.—
C. B. JORDAN, *Editor*.

SOME WAYS OF STIMULATING THE STUDENT'S INTEREST IN BOTANY.*

BY C. J. ZUFALL.

This paper is based upon the assumption that a student learns a great deal more when he is interested in the subject being taught. It is also assumed that it is the duty of every teacher to make every possible effort to arouse this interest in the student.

In teaching Botany, the question of proper material for laboratory study is an important one. It is evident that the material must be suitable to the occasion, but the interest of the student could be aroused decidedly in a great many cases by the use of "crude drugs."

This plan is, of course, a valuable one in teaching Pharmaceutical Botany, but even the student of pure science, or the high school student would be more interested in such a study if he knew that the material under observation had some curative property.

I think I am safe in saying that many students of botany finish their four-year college course without the realization that there is a close relation between botany and medicine. How many graduates in botany know that the latex of a seed pod relieves more pain than any other substance in the world? Or how many have the fact brought to their attention that the leaf of the pretty foxglove is the most valuable heart tonic known? How many consider the danger to animals and children of the poisonous seeds of the common castor bean, although, from the same seed, our harmless castor oil is expressed?

These crude drugs, of course, are available to schools of pharmacy, but other schools may secure them at a small cost from a wholesale drug house. This material will be found in the dry state, but it is remarkable what can be obtained from it.

Beginning with the lowest forms of plant life we could very well use purified siliceous earth. The beginner in microscopy finds this material easy to mount and there is no difficulty in finding what is wanted. The variety of peculiar forms of diatom skeletons makes the study attractive and there isn't much trouble in getting satisfactory drawings. Considerable emphasis should be placed upon the point of getting the student to feel that his first attempt in microscopy has been a success. In the same laboratory period the living diatoms should be studied. If time permits of more extended study of diatoms, Agar could be examined for the circular skeletons of *Arachnoidiscus*, which are nearly always present in this substance, and make an interesting study.

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For a study of the larger algae we have *Chondrus* and *Fucus*, both of which give the inland student a good idea of what seaweeds are like.

To represent the fungi we have on our shelves three drugs—the White Agaric, Ergot and Yeast. Ergot illustrates the means by which this parasitic fungus lives through the adverse conditions of winter. In the study of the growth of yeast the student learns how alcohol is produced as the metabolic bi-product of the plant.

Even the lichens have representation in pharmacy in the form of *Cetraria*.

The Bryophytes are not to be omitted, because a valuable, though not a potent product is found in the form of sphagnum moss. When cleaned and dried this plant forms a very good absorbent dressing which costs less and absorbs much more moisture than absorbent cotton. The reason why this plant is a valuable absorbent could be made the basis of a study in Histology. Such a study would reveal the fact that the larger part of the leaves of the plant is composed of dead, empty cells with porous walls. Such a structure makes possible the absorption and retention of large quantities of water.

From the Pteridophytes we get two important drugs, namely, *Lycopodium* and *Aspidium*. The former consists of the spores of *Lycopodium clavatum* and can be used in the study of the asexual spores of the vascular cryptogams. Their peculiar shape and reticulate surface make interesting microscopic studies for the beginner in microscopy.

The Male Fern plant makes very good material for the study of the histology of the ferns. Schools of pharmacy should all have the two common species of *Dryopteris* growing in their gardens, from which the material could be obtained.

For studies of flowering plants we find many crude drugs of considerable value. For the study of leaves the following drugs are found in almost the whole state and suitable for class work: Buchu, Eucalyptus, Uva Ursi, Damiana, Coltsfoot, Pilocarpus, Senna, Grindelia, Peppermint and Thyme. An examination of these reveal the fact that they possess a wide diversity of color, texture, shape, margins, hairs, oil glands and other surface markings. There is Buchu with an oil gland at the base of each tooth and its pellucid punctate surface; there is Coltsfoot with its under-surface made white by the innumerable long hairs; there is Eucalyptus, with the unusual shape of a scythe, an occasional one from a young branch being symmetrical, showing a peculiarity exhibited by some plants of producing differently shaped leaves on branches of different ages. Grindelia leaves are so thickly covered with a resinous exudation that the plant is called "gum-plant." With a hand lens the student can easily find the glandular hairs on the Peppermint leaves and stems. These are the structures which yield peppermint oil. Menthol, known to most people, is obtained from this peppermint oil.

For a study of leaf-buds, the pharmacist has Balm of Gilead buds which show so decidedly the way in which Nature sometimes protects the tender organs by coating them with a water-proof oleoresin.

When we come to the study of carnivorous plants we may take from our shelf the drug *Drosera* or sundew, which is known to all of you and which is used by some physicians.

For the study of flowers and parts of flowers we may find several drugs on our shelves which, though dry, are whole and in a good state of preservation. Arnica

and *Matricaria* are excellent representatives of the composite flowers, showing the characteristic ray and disc florets. The akenes of *Arnica* may be used in a study of the pappus which, in this case, consists of multiserrate hairs. If these flowers, as found in the drug store, are soaked in warm water for a few minutes, they are as good as fresh material.

Mullein flowers may be used for a study of adhesion of parts of a flower. This drug consists of the corolla with the stamens adhering to it. The hairs on the inside of this corolla are of the peculiar stellate variety. This flower also shows the peculiarity of having two kinds of stamens, three short, hairy ones and two longer ones with few hairs.

Spanish Saffron may be used in studying stigmas. In Hoarhound and Pennyroyal the persistent calyces are always found and may be used in the study of the calyx. They are quite rigid and easily handled without breaking. Pennyroyal is also of interest because the exterior is thickly dotted with glandular hairs.

Orange flowers as found on our shelves are rigid and the parts not broken up, so that, after soaking for a short time, they form excellent material for the study of flowers.

For representative fruits one does not have to search long among crude drugs. The following list shows what one may find: Cubeb and Pepper are drupes; Malt is a caryopsis; Capsicum and Colocynth are berries; Anise, Caraway, Fennel, Coriander and Parsley are cremocarps; Poppy fruit is a capsule.

For a study of seeds what greater variety could one find than in Pepo, Mustard, Cardamom, Colchicum, Linseed, Myristica, Nux Vomica and Strophanthus.

For a study of digestion in plants, the preparation of malt makes an interesting study. By means of the amyolytic enzyme, diastase, furnished by the seed itself, the insoluble starch is converted into sugar and dextrin. Therefore, the malt contains two medicinal substances, namely, a predigested food and diastase which is an aid to digestion.

Another interesting phenomenon is the formation of the amyolytic enzyme, "Takadiastase," by the growth of the mold *Aspergillus*.

For a study of the microscopic structure of monocotyledon stems we use the drug *Triticum*. For the study of dicotyledon stems we use *Dulcamara*.

ADDRESS BEFORE THE STUDENTS OF PURDUE UNIVERSITY SCHOOL OF PHARMACY.*

W. F. RUDD.**

Thirty years is a long time. It represents in the lives of most men and women about all the time there is for genuinely constructive work. It is longer than you have lived. Those of us who have been in college teaching for such a period have seen thirty groups of young men and women take up their chosen work, complete it or fall by the wayside, and then go out into the world to meet the opportunities and responsibilities of business, home, community, church and state.

Thirty years of such experience and contacts should have given us older men

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