

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

The Conferences of Teachers of Pharmacy, Chemistry, Materia Medica and Pharmaceutical Economics held annually give splendid opportunities for the presentation of papers and for the discussion of subjects of interest to all teachers of Pharmacy. Unfortunately, space will not permit the printing of discussions, but all papers are printed in this section of the *JOURNAL*.

It has been my endeavor to group these papers whenever possible and the following papers on Botany and Pharmacognosy will be of special interest to teachers of Materia Medica.—
C. B. JORDAN, *Editor*.

THE TEACHING OF BOTANY.

BY C. C. PLITT.

It goes without saying that the teacher of Botany, should be well prepared for teaching his subject. He cannot know too much of it, even if he is called upon to teach the more elementary parts of Botany to Pharmacy students. What, after all, is most important to teach such students about plants? Two things at least, either one of which can be called first and foremost, and both so closely connected that they must be taken together. One of them would be a general knowledge of the plant kingdom. He should be taught that there are four large divisions of plants, and how they are distinguished one from another. He should know, too, the subdivisions of each; that the Thallophytes are conveniently divided into five groups, two groups of which, the Algae and the Fungi, stand out conspicuously, and of which he should know the main subdivisions. He should know, too, that there are two large groups of the Bryophytes, at least three of the six groups of the Pteridophytes, and the two groups of the Spermatophytes and their subdivisions. He should be taught that this classification is one not only for convenience, but that back of it all is the idea of greater and greater complexity in structure and development; that the Thallophytes are the lowly organized plants, many consisting of but one cell, that the Mosses are much higher, and that the Seed Plants are most highly organized. It is only a step now, to classification or taxonomy in general. Then, too, he should be taught that the plant is a living entity, and the meaning of this concept. What is meant by living? What peculiarities distinguish a living thing from the non-living? What is meant by an organism, an organ, and what by a life history? He should be taught that every living thing has a live history, the story of its development from its earliest life until it reproduces its kind. He should learn of the various ways by which plants may reproduce themselves, of sexual reproduction and of propagation.

The idea of organs leads to a study of function, and the student should learn, as far as possible, the uses of the many organs that, in countless ages, have gradually been evolved by plants.

These two things, which I claim should be taught, should stand out as a back ground and be kept constantly in mind. It is true that in teaching Pharmacy students, the fact must not be lost sight of that one of the real reasons for their study of Botany is, that they will use this knowledge in the study of Pharmacognosy. Morphology, therefore, and especially that of the highest plants must

receive most attention and there should be no especial difficulty in communicating it.

An outline of how best to present the course depends much upon whether the study is to be given in one semester or throughout the year or, as with us, it is divided, and the gross anatomy and more elementary part of vegetable histology are given at one time, and the more difficult part at another time. Right here, let me emphasize that at no time should Botany be taught the beginner by starting him off with the compound microscope. I have tried various ways and have found that much depends upon whether the course is given during the first semester or the second. For the fall course, start out at once with a complete flowering plant; point out the vegetative organs and the reproductive organs; the student should have, at least, some idea of what the thing is about. Next, take up the flower, while some may still be found; then fruits and seeds and their germination; then stems, buds and leaves. The student, having learned what is meant by a Spermatophyte or Seed Plant, can easily study a fern and its life history; then a moss and its life history and alternation of generations; and lastly, representative Thallophytes, one or more Fungi and one or more Algæ, and then be made acquainted with the compound microscope. Knowing now, that there are plants consisting of one cell, some of rows of cells, etc., etc., the time has come to study a typical plant cell—that all plants are built up of cells, that these form tissues and are variously constructed and arranged in our higher plants.

If the course is given in the second semester—start with fruits and seeds, and bring in flowers last. Spring, with its many flowers, is the ideal time to study Taxonomy.

The course in Vegetable Histology should follow this preliminary course. Begin with the plant cell; onion epidermis is ideal for this purpose. It is easily obtained; it can be used, too, as material, when the student makes his first permanently mounted slide. Next, the tissues, parenchyma, collenchyma and sclerenchyma are studied and then epidermal tissue with its stomata and trichomes. Parenchyma, as storage tissue, follows, with the starches, aleurone grains, crystals, secretory ducts, mucilage sacs, intercellular air spaces, milk tissue, etc., etc. Next take up wood fibres, bast fibres, tracheids, vessels and then the various fibrovascular bundles. At some time during this part of the course the student is instructed how to calibrate the eyepiece micrometer, and he measures a number of starch grains and other microscopic objects; next, the arrangements of the tissues and fibrovascular bundles in the several plant organs, especially in stems, rhizomes, roots and leaves of the higher plants is taken up.

Vegetable histology, naturally, leads to the study of vegetable powders, and the remainder of the course can be given over to the study of a number of representative powders.

THE TEACHING OF PHARMACOGNOSY.

BY F. J. BACON.

The Section on *Materia Medica*, during the past few years, has heard papers on the teaching of Pharmacodynamics, Physiology, Toxicology, Bioassays and Bacteriology. This year papers on the teaching of other subjects under the general