THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

THE TEACHING OF PHARMACOGNOSY.

BY CHARLES C. PLITT.

Teachers of pharmacognosy will be interested in the following article by C. C. Plitt. I have no record of the discussion that followed the reading of this paper. Perhaps it would be illuminating.

Our Teachers' Conferences will justify themselves in so far as exchange of ideas about teaching are made. C. B. JORDAN, Editor.

In the teaching of Pharmacognosy, there probably cannot be a great many ways of attacking the problem, and, no doubt, the way I am about to describe, is the way of many other teachers. As a matter of fact, I can think of but two ways of handling the subject.

Lest there be some who may use the terms I am using with a different meaning, I will say that under Pharmacognosy, I mean the study, or art, of recognizing the drug in question, and is here restricted to those of plant and animal origin. We know, too, that these may be either in the whole state or in powdered condition. This paper deals only with drugs in their natural and entire condition. By Materia Medica, I mean the study of drugs to the fullest, Pharmacognosy being one of its many sub-divisions.

In teaching Materia Medica, there are several ways in which drugs may be studied; thus, they may be taken up alphabetically, as they are in the Pharmacopœia and the National Formulary. They may be taken up according to their therapeutic actions, when all the astringents are studied together, all the stimulants, the demulcents, etc. Again, they may be taken up according to their morphological structure, all the roots being studied together, all the flowers, all the leaves, etc. Or, they may be studied according to their chemical constituents, when all the starchy drugs are studied together, all those with volatile oils, all those with alkaloids, etc. And, finally, they may be studied, taking the drugs up in what is called their natural sequence, the various plants producing drugs being taken up by beginning with the lowest and simplest of the Thallophytes, then up through the various sub-groups of the Plant Kingdom to the highest of the Spermatophytes, the order being according to their natural affinities or relationship, the lowest evolved coming first and the highest evolved last. In the study of Materia Medica, this is probably the best and only right way, and many authors of textbooks follow it.

To return to my statement, that I can think of but two ways to teach Pharmacognosy: Either take up the drugs according to their natural sequence, which I described as probably the best and the right way to teach Materia Medica, or to take them up according to their morphologic structure. Although I am sure that the former is the right way to teach Materia Medica, I am equally as certain that the latter is the only right way to teach Pharmacognosy. I have tried it out during the past three years and am convinced of it.

My way of teaching Pharmacognosy, and it may be peculiarly my own, is to divide the two hundred and fifty or more drugs, described in the Pharmacopœia and the National Formulary, into several groups, and these into sub-groups. My aim is to get drugs closely resembling each other close together.

The first group of drugs that I take up is that of "Leaves." I start with leaves, because as a group their study is the easiest. They are easily drawn, and for the most part easily recognized, and students are not likely to become disgusted with the subject at the very beginning. I divide the group of leaves into three sub-groups: small leaves, medium-sized leaves and large leaves. My first lesson is on the small leaves, just six in number. I bring the six leaves into the class room, Buchu, Pilocarpus (I still hold on to Pilocarpus, although no longer official, because it is the source of Pilocarpine), Uva Ursi, Senna, Chimaphila and Damiana. I explain to the class how I am able to recognize each of them. I show them that we can separate them into two divisions, some with pellucid dots, and some without pellucid dots. There are two with pellucid dots, Buchu and Pilocarpus, and these two can be easily separated, one having a serrated margin, Buchu, and one with margin entire, Pilocarpus. There are four in the division without pellucid dots. These four can be separated into two sub-divisions, some with margin entire, and some with margin serrated. If margin is entire it is Uva Ursi if the leaf is thick, and Senna if it is thin. If Senna, it may be Alexandria Senna, or it may be India Senna, and they are told how to distinguish them. I should have stated also, under Buchu, that students are told, how to recognize the species of Barosma that are known as Long Buchu, and which are Short Buchu. To return to our discussion, if the margin is serrated, it is Chimaphila if the leaf is thick and Damiana if it is thin. Other peculiarities of these leaves are brought forth, especially those that distinguish closely related species that may be official. Students must look up the Latin name, English name, Synonyms, Botanic Source, Family, Part Official, Habitat, Properties, Preparations and Doses, answers to all of which must appear on the laboratory sheet, when it is handed in. In the laboratory, these drugs are distributed as numbers, and part of the lesson is in determining the drug. Students draw the leaves, and besides answering the questions given above, add their own observations.

The next lesson is on the medium-sized leaves. In this sub-group, I include Eriodictyon, Althææ Folia, Malvæ Folia, Hamamelis, Matico and Boldus. These I divide into two divisions, those covered with resin, Eriodictyon, and those not so covered, the remaining five, which are divided into two sub-divisions, those with petiole long and those with petiole short or none. Under petiole long, it is Malvæ Folia if petiole is from four to eight inches long, and Althææ Folia when petiole is only about one-fifth length of blade. Under petiole short or none, it is Boldus if leaf is symmetrical, and either Hamamelis or Matico if unsymmetrical, Hamamelis if margin is undulate, and Matico if margin is merely rough and almost entire.

The lesson on large leaves includes Eucalyptus, Farfara, Verbasci Folia, Castanea, Digitalis, Belladonnæ Folia, Stramonium and Hyoscyamus. I separate these into two divisions, those with pellucid dots, Eucalyptus, and those without pellucid dots, the remaining seven. These, in turn, are divided into two subdivisions, those more or less woolly, Farfara and Verbasci Folia, and those not

woolly, the remaining five. Farfara is distinguished from Verbasci Folia by being woolly on lower side only, whereas Verbasci Folia is woolly on both sides. The leaves that are not woolly are distinguished as follows: If margin is serrated, it is Castanea, if crenate it is Digitalis, if entire it is Belladonnæ Folia, and if incised it is either Stramonium or Hyoscyamus, the latter if glandular hairy and the former if almost smooth.

Since fruits may be present in the case of Belladonnæ Folia and Hyoscyamus, this is mentioned: They are described and give additional aid in recognizing these two drugs. Since Belladonnæ Folia, Digitalis, Stramonium and Hyoscyamus come crumbled and in almost unrecognizable state for beginners, I have hot water on hand when this lesson is given, and students soak the leaves. When this is done, their margins may be studied with some satisfaction.

The leaves having now been studied, the three little keys are put together and we have our scheme or key for recognizing the official leaves. A review is now given and interesting facts like these are brought forth: Which of the official leaves have pellucid dots? Which are woolly? Which have an entire margin? Which Families are represented? Which Family is best represented? Which next best? Name the official leaves belonging to each of these families. Which of the official leaves can be recognized by their odor? etc., etc.

KEY FOR LEAVES.

- Leaves
  - Small
    - With pellucid dots
      - Margin serrated ..... Buchu
      - Margin entire ..... Pilocarpus
    - Without pellucid dots
      - Margin entire
        - Thick ..... Uva Ursi
        - Thin ..... Senna
      - Margin serrated
        - Thick ..... Chimaphila
        - Thin ..... Damiana
  - Medium
    - Resinous ..... Eriodictyon
    - Not resinous
      - Petiole long
        - Petiole, 1/6 length of blade ..... Althææ Folia
        - Petiole, 4–8 inches long ..... Malvæ Folia
      - Petiole short or none
        - Unsymmetrical
          - Margin undulate ..... Hamamelis
          - Margin almost entire ..... Matico
        - Symmetrical ..... Boldus
  - Large
    - With pellucid dots ..... Eucalyptus
    - Without pellucid dots
      - Woolly
        - Lower side only ..... Farfara
        - Both sides ..... Verbasci Folia
      - Not woolly
        - Margin serrated ..... Castanea
        - Margin crenate ..... Digitalis
        - Margin entire ..... Belladonnæ Folia
        - Margin incised
          - Almost smooth ..... Stramonium
          - Glandular hairy ..... Hyoscyamus

Having disposed of the official leaves, I next take up the seeds, then the seed-like fruits and fruits. I have no reason for this, except that I believe that the drugs belonging in these groups are easier to study than the groups which I take up later. Here, again, the same scheme is followed as with the leaves, things that resemble each other closely are brought together, and the differences that distinguish them from one another are brought out. Especially difficult are such groups as the one composed of fruits of the Umbelliferæ, and the one composed of Piper, Cubeba, Pimenta, Cocculus and Rhamnus Cathartica. However, differences are noted, keys are prepared and the matter of recognizing each particular drug becomes simple and easy. The greatest difficulty that I have to contend with is not in recognizing the drug, but the difficulty of remembering the name.

After the fruits, I have a group that I have called "Odds and Ends." In this group I put such dissimilar things as Ergota and Caryophyllus, Sabal and Galla, Scilla and Tragacantha, Camphora, Cetaceum and Paraffinum, and is followed by the Gums, the Resins, the Balsams and then the Woods. After which, I take up the "Herbs," those drugs whose official part includes not only leaves but frequently flowering tops, and sometimes even the whole plant, including the roots. After the "Herbs" come the official flowers, including parts of flowers, for example, Crocus and Zea. Then the roots, including rhizomes, corms and bulbs, and last of all, the barks. The scheme followed is always the same, and those drugs most nearly alike are studied together.

My final examination always consists of two parts. In the first part a student is given a package in which he finds five smaller packages. In one of these smaller packages he will find small leaves, which may be those of but one drug; they may, however, be a mixture of two drugs, or even of three drugs. In another of these smaller packages are large leaves, those generally required to be soaked in order to study them, and again they may be those of one, two or three drugs. The medium-sized leaves are also put into this package. In a third package are found barks, in the fourth roots, including rhizomes, etc., as stated above, and in the fifth any of the remaining drugs, odds and ends. Since each small package contains either one, two or three drugs, the number of drugs can vary from as few as five to as many as fifteen. I arrange that each large package contains just ten, although this number is not known to the student. All he knows is that he must have at least five to determine that he may have as many as fifteen. In taking this part of the examination, the student is permitted to make use of his notes, the Pharmacopœia, the National Formulary, in fact anything, excepting aid from some other student. The second part of the examination consists in recognizing ten different drugs, selected so as to make a fairly representative group, a few easy, a few fairly easy and a few difficult, this time without the use of notes. The student, after recognizing the drug, writes down its Latin name, English Name, Synonym, Botanic Source and Family. If a student misnames a drug, no credit is given him for any part of the question, unless there is good reason in believing that there was some justification in making the error. The results of the two examinations are averaged together and give the mark for the year.

MORE SCHOOLS OF PHARMACY ADOPT THE FOUR-YEAR COURSE.

Those who are interested in the educational development of pharmacy in the United States will be pleased to know that four more colleges of pharmacy will be rapidly added to the list of those colleges that have eliminated the shorter courses and offer only the four-year course as a minimum. I have just been informed that the deans of the four Pacific Northwest Colleges of Pharmacy; namely, The Oregon State Agricultural College School of Pharmacy, Corvallis, Oregon, North Pacific College of Oregon School of Pharmacy, Portland, Oregon, The Washington State College School of Pharmacy, Pullman, Washington and the University of Washington College of Pharmacy, Seattle, Washington, at a conference of the deans and faculties of the above-named schools held at Portland, Oregon, January 28, 1928, decided to discontinue the three-year course for students entering the above-named colleges for the school year of 1930–31. Beginning with the school year of 1930–31, the four-year course will be the minimum course of instruction offered.

The same mail brings a statement from the Chancellor of the University of Porto Rico as follows:

"I am delighted to inform you that the faculty of the College of Pharmacy after a careful study of the problems of the College and of the pharmaceutical profession in the island, has voted that the three-year course in pharmacy shall be discontinued as rapidly as the students now enrolled in that course complete their diploma requirements. Students enrolling in the College of Pharmacy for the first time in the Fall of this year and thereafter will enroll in a four-year course leading to the bachelor's degree in this field."

Beginning with 1930 these five colleges will be added to the present list of Ohio State University, University of Minnesota and the University of Nebraska as colleges that do not offer less than a four-year course. I believe that this indicates that pharmacy will rapidly reach the dignity of a profession and I hope that the action of the above-named colleges will be a spur to other colleges to take similar action.—C. B. JORDAN, *Editor*.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meetings of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

BALTIMORE.

The January meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Emerson Hotel on Friday evening, January 27, 1928.

The speaker of the evening was Dr. Olaf S. Rask of the School of Hygiene and Public Health of the Johns Hopkins University. His address consisted of a report on an experimental study of the biological and dietary properties of aluminum compounds recently completed by E. V. McCollum, O. S. Rask and J. Ernestine Becker, in the nutrition laboratories of the School of Hygiene and Public Health. The summary and conclusions were as follows:

Rats were fed diets containing 600 p. p. m. of the element aluminum both in the form of the choloride and in form of the residue of sodium aluminum sulphate baking powder. The ash residues of all organs of rats so fed for eight months and the ash residues of baby rats born of them contained less aluminum than could be detected by a spectrographic technic capable of detecting 0.005% of aluminum in the ash. This is equivalent to 0.5 p. p. m. on the basis of the fresh tissue when an ash content of 1% is assumed. Therefore aluminum compounds are not absorbed out of the intestinal tract. Spectrographic examinations of the intestinal and stomach walls of rats which had been raised on aluminum containing diets showed that aluminum when present in the diet does not form any union with the walls of the alimentary tract. Aluminum compounds in the diet in concentrations as high as 600 p. p. m. of the element aluminum exert no noticeable action harmful to growth, reproduction or general well-being as judged by external appearance and autopsy.

Slides were used to indicate the methods of