

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

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DEPARTMENT.

A definite statement by an authority of what a college course should embrace is welcomed by all teachers of that subject. The study of applied botany, applied chemistry, applied physiology, as well as applied physics, is quite important in building such a professional curriculum as that of pharmacy. The leaf is the most important biochemical laboratory contributing to the welfare of man, and not only deserves considerable attention but should be a means of interesting students in botany. Several important drugs consist either of leaves themselves, or the active principles of leaves and therefore deserve particular attention in botany applied to pharmacy as well as in pharmacognosy. The following paper by Dr. Youngken will interest all teachers of botany.—C. B. JORDAN, *Editor*.

THE STUDY OF THE LEAF.

BY HEBER W. YOUNGKEN.*

Botany, like chemistry, has long been recognized as fundamental to the proper understanding of Pharmacognosy and Pharmacy. One of its most alluring phases is that dealing with the study of the leaf. The leaf and the flower are the two most necessary parts to have in hand in making certain and ready identification of an unknown plant. Of the many vegetable drugs, leaves rank second in number only to roots so that the importance of their fundamental study is obvious.

In the education of students of Pharmacy are we to look upon Botany merely as an academic course or are we to continue to recognize that, in addition to its cultural value, it has its professional pharmaceutical side which, if developed with the student by properly coördinating it with Pharmacognosy, will be of inestimable value when he comes to pursue the professional course in the latter subject?

Let us examine the content of each of two courses on the leaf phase of Botany, the first a typical academic course, the second a typical pharmaceutical one.

OUTLINE OF THE STUDY OF THE LEAF (ACADEMIC COURSE, 1ST YEAR BOTANY).

1. DEFINITION. Origin and Development of Leaves.
2. OUTER MORPHOLOGY OF THE LEAF—Leaf blade, petiole, stipules, venation, simple leaf, compound leaf (pinnately and palmately compound), leaflets, leaves of different forms on the same plant (heterophylly).
3. MICROSCOPIC ANATOMY OF THE LEAF. (a) Anatomy of blade of dorsiventral leaf. (b) Anatomy of petiole of dorsiventral leaf.
4. PHYSIOLOGY OF THE LEAF.
 - A. Photosynthesis. (a) Raw materials. (b) Sunlight, the energy factor. Relative effectiveness of different parts of the spectrum. (c) Function of chlorophyll. (d) Efficiency of the leaf in utilizing the sun's energy. Measurements of the quantity of light energy which is absorbed by the leaf and of the quantity which is utilized in photosynthesis. Demonstration, using a variegated leaf. (e) By-product. (f) End-products. (g) Rate of carbohydrate production. (h) Conditions influencing the rate of photosynthesis. (i) Utilization of the product of photosynthesis.
 - B. Transpiration. (Experiment with potted plant using bell jar. Experiment with Potometer in measuring rate of transpiration.)

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(*a*) Definition. (*b*) Utility to the plant. (*c*) The transpiration stream. (*d*) Cooling effect of transpiration. (*e*) Conditions affecting transpiration rate. (External and internal conditions). (*f*) Other conditions of reducing transpiration.

C. Respiration in leaves.

D. Autumnal coloration of leaves including conditions favoring the production of anthocyanins.

E. Special functions sometimes performed by leaves. (Protections by bud scales, spines, water storage, food storage, attachment by tendrils, capture of insects.)

5. LABORATORY STUDIES mainly devoted to experiments in plant physiology with little microscopic work of elementary character.

OUTLINE OF THE STUDY OF THE LEAF (PHARMACEUTICAL COURSE).

1. DEFINITION OF LEAF. Outstanding Leaf Drugs.
2. THE COMPLETE LEAF. (*a*) Leaf blade—general structure of lamina. (*b*) Petiole—petiolate and sessile leaves. (*c*) Stipules—stipulate and exstipulate leaves.
3. LEAF FUNCTIONS. (*a*) Photosynthesis. (Materials, energy factor, end products.) Demonstration of photosynthesis using variegated leaf. (*b*) Assimilation. (Utilization of the product of photosynthesis.) (*c*) Respiration. (*d*) Transpiration. Demonstration, using potometer.
4. TYPES OF LEAVES DEVELOPED IN ANGIOSPERMS.
5. ORIGIN AND DEVELOPMENT OF LEAVES.
6. PHYLLOTOXY—Terms referring to forms of leaf arrangement, including alternate, opposite, verticillate, decussate and fascicled.
7. VERNATION—Forms of leaf folding in bud.
8. LEAF VENATION—Mid-rib or primary vein, middle primary, lateral primaries, kinds of venation: furcate, parallel, reticulate, pinnately veined, palmately veined, pinnate-reticulate, palmate-reticulate, anastomosing, tessellated and impressed.
9. LEAF INSERTION—Terms referable to leaf insertion including radical, cauline, ramal, perfoliate, amplexicaul, connate-perfoliate, equitant.
10. FORMS OF LEAVES. (*a*) Simple leaf defined. (*b*) Compound leaf defined; pinnately and palmately compound leaves: (leaflets, petiolule, rachis).
11. FORMS OF LAMINA with terms referable to each subhead as follows: General Outline, Apex, Base, Margin, Lobing of Lamina and Transition to Compound Leaf.
12. FORMS OF PINNATELY COMPOUND LEAVES.
13. FORMS OF PALMATELY COMPOUND LEAVES.
14. LEAF MODIFICATIONS.
15. LEAF TEXTURE—Terms referable to, as membranous, succulent and coriaceous.
16. LEAF COLOR.
17. LEAF SURFACE—Terms referable to, as pellucid-punctate, glabrous, pubescent, tomentose, scabrous, etc.
18. DURATION OF LEAVES—Terms referable to.
19. GROSS STRUCTURE AND HISTOLOGY OF THE PETIOLE. (*a*) The pulvinus and stalk portions and shapes of petioles. (*b*) Sheathing petioles—Pericladium. (*c*) The Phyllode. (*d*) Histology of monoctyl and dicotyl petioles.
20. STIPULES. Definition. Forms of lateral and axillary stipules. The ligule and ochrea. Modified stipules.
21. GROSS STRUCTURE AND HISTOLOGY OF THE LAMINA. (*a*) Dorsiventral types including hydrophytic, mesophytic and xerophytic. (*b*) Bifacial type. (*c*) Centric types including xerophytic and succulent. (*d*) Study of a powdered leaf drug.
22. STRUCTURE AND DEVELOPMENT OF STOMATA. Neighboring cells.

23. LABORATORY STUDIES—the gross morphology and histology of leaves of medicinal and horticultural plants. Demonstration of the leaf drugs of the U. S. P. and N. F. as well as some unofficial ones. Leaf fibres as *Sansevieria*, etc.

A careful examination of the outlines presented here, the first of a general university academic course in botany, the second of a course in botany given in a pharmaceutical college or in a college of pharmacy of some universities where morphology is emphasized, will reveal the fact that in the former, plant physiology is emphasized with hardly sufficient plant morphology for the proper understanding of physiology, whereas in the latter, plant morphology receives the greater emphasis with sufficient plant physiology and ecology for their broadening value, for holding the interest of students during the presentation of the subject and for the needs of the average pharmaceutical career.

PHARMACY AND THE COMMITTEE ON ECONOMIC SECURITY.

BY ROBERT P. FISCHELIS.*

IN THE near future President Roosevelt's Committee on Economic Security will present plans upon which the Congress will base legislation pertaining to unemployment insurance, old-age pensions and possibly sickness insurance and other social welfare projects.

Announcement has been made of the selection of a Medical Advisory Committee to coöperate with the Committee on Economic Security on problems involving the practice of medicine. Some concern has been expressed by pharmacists that no one representing pharmacy has a place on this Advisory Committee and that no Pharmaceutical Advisory Committee has been appointed.

So that the members of the AMERICAN PHARMACEUTICAL ASSOCIATION and others interested may know that we have not been unmindful of the opportunity for coöperating with the Government in matters of public concern which may or may not affect the practice of pharmacy, we present the following information:

Early in October the writer was called into conference with members of the staff of the Committee on Economic Security to discuss pharmaceutical phases of health insurance. At that time the Committee on Economic Security was exploring the entire field of social insurance and information was sought from the various health professions with regard to problems that would affect them. We supplied the Committee with the information it asked for. It was pointed out to us that the Committee would seek further information if and when it became apparent that health insurance was to be a part of the administration's legislative program. A definite promise was made to the writer at that time that a representative group of pharmacists would be sought to advise the Committee on Economic Security with reference to the pharmaceutical phases of any program that may be developed. Further contact with the Committee indicates that the program has not reached a stage requiring our coöperation. Physicians are of course concerned with old-age pensions and other social legislation as well as health insurance. The Medical Advisory Committee was therefore appointed earlier.

With assurances that we shall be called upon to give advice when health in-

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