Elementary Botany at the University of Illinois

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The elementary course in general botany at the University of Illinois has recently been altered to conform more appropriately with two newer viewpoints in plant science teaching—the integration of elementary botany into the cultural scheme of the liberal arts curriculum rather than instruction for the training of professional botanists, and the establishment of a course in plant study without laboratory available to upper-classmen who, limited by advanced-course requirements in the pursuit of majors, are often unable to round out a broad cultural training in science because of the relatively large numbers of hours required by the usual elementary science course. In the adjustment of our course to meet the first of these viewpoints, we have completely eliminated or appreciably curtailed certain topics customarily included in the general botany course. Among such subjects are detailed food chemistry, the minutiae of stem anatomy and of life histories, the fern allies, genetics problems, and the tracing out of heterospory in plants. For them we have substituted or lifted into greater prominence the more imminent and often more vital studies of root growth and its relation to soil erosion, forest distribution in the United States, forest utilization, wood structure and properties in relation to uses, the cause, migration, and control of plant diseases, the interrelations of plants and animals, mechanisms of pollination, the influence of specific crops upon human history, vegetation types in Illinois, annual rings and climatic cycles, etc. These latter subjects by virtue of their contemporaneous significance, their part in the vast cycles of synthesis and analysis in nature, their emphasis upon the essential unity of living matter, or their pragmatic implications, focus and intensify attention and interest which often evaporate so easily under the continued impact of unrelated technical terms, difficult concepts, and unending microscopic view of objects usually unplaced and unoriented in the student's past or present experience with plants.

The elementary botany course at the University of Illinois is a one-semester course, really made up of two courses, Botany 1a, with two lectures and one discussion group per week, and Botany 1b, a laboratory course with 4 hours of laboratory work per week. The lectures in Botany 1a are given by five members of the full-time staff, each lecturing on subjects in, or related to, his special field of work. The laboratory teaching is the work of half-time graduate assistants under the supervision of a full-time staff member. There are two types of discussion groups. In those for students taking only the lecture course, the work of the discussion group is mainly demonstration and illustration by the instructor; in those groups for students registered in both lecture and laboratory courses, the work is largely devoted to review and recitation. All of the discussion groups are in charge of the men who lecture in the Botany 1a course. Insofar as possible, the lectures are supplemented by motion pictures, some of them made by members of the staff, others obtained through the Visual Aids Service of the University.

In the laboratory course, microscopic examination of prepared slides has been reduced to a minimum. Whenever microscopic work is indicated, students are urged to make their own slides from fresh material. Field trips to University Woods, to the floriculture greenhouses, and on the campus to study native and cultivated trees, shrubs, and weeds are frequent. Drawing has been materially reduced and the traditional notebook is no longer a shibboleth in the presence of which the student who has little skill with pencil must tremble. Notebooks are collected at stated intervals by the instructors and are marked merely satisfactory or unsatisfactory. In the latter case the student must repair his work and submit it again for approval. No grades are given these notebooks. The laboratory grade is based upon the student's observational ability, upon the grades which he makes upon short weekly quizzes, and upon the midsemester and final examinations. Before the alterations in the course were made, six hours were spent

TABLE I—ANNUAL ENROLLMENT

	Botany 1 (before separation)
1932-33	222
1933-34	266

	Botany 1a	Botany 1b
1934-35	478*	345
1935-36	479	358
1936-37	508	340

* A small portion of this increased enrollment is attributable to an increase of 7% in the total university enrollment over the enrollment of 1933-34.

each week in laboratory. In the new course, two two-hour periods are spent in laboratory study. This reduction may be regarded as a wise move, for students, not beset by the fatiguing load of six hours of laboratory, work more briskly and accomplish virtually the same amount of work in the four-hour period. Further, many advanced students unable because of required courses to devote six hours weekly to laboratory study, are able to fit four hours into their programs.

Statistics collected over a period of three years show interesting results of this cleavage of the elementary course. First, a marked increase in registration followed the separation; this increase is to be attributed to two factors: the reduction in laboratory hours, and the availability of a plant science course without laboratory work to groups of upperclassmen majoring in other fields. Table I presents enrollment figures for elementary botany before and after the reorganization.

Another result, one of great significance as a weapon against those who would replace the laboratory method by lecture-demonstrations, shows that laboratory study exerts a marked effect upon the mastery of textbook and lecture material. Table II presents grade distributions for two years for students registered in both lecture and laboratory courses and for students registered in only the lecture course.

TABLE II

	1935-1936		1936-1937	
	Students taking both lecture and laboratory	Students taking lecture only	Students taking both lecture and laboratory	Students taking lecture only
A's	20%	14%	15%	8%
B's	28%	19%	32%	27%
C's	37%	42%	35.5%	41%
D's	8%	14%	9%	14.5%
E's	7%	11%	8.5%	9.5%

Before revision of the course two staff members presented most of the lectures. Since the reorganization of the course, five facultymen have given the lectures. Occasional complaint from students that "we can't get adjusted to five styles of lecturing" led to a questionnaire upon their preferences in the matter of one lecturer or several lecturers. Table III shows the results of the questionnaire, correlated with the grades of the students polled.

TABLE III

	Several lecturers preferred	One lecturer preferred
A students	27	3
B students	48	13
C students	20	78
D students	4	26
E students	6	12
Total	105	132

The figures show clearly that the A and B students are inclined to include in their diets the spice of life, variable and uncertain though it may be, whereas the average and inferior students prefer to munch more regular, more readily digestible, perhaps more monotonous fare.

The changed emphasis upon the material presented, the reduction in laboratory hours, and the abolition of the notebook fetish have contributed to a more satisfactory coordination with the liberal arts program and have increased markedly the interest shown by elementary students in plant study. The separation of the course has had one disadvantage—a large percentage of the students registered for lecture only are low-quality students who are too lazy to register for five hours of science in one semester. This group distinctly retards the work of the lecture-only students. However, the fact that many able upperclassmen, who would not otherwise take botany, register for the lecture course is a desirable end which in our opinion outweighs the just-mentioned disadvantage.