The Curriculum in Agriculture: A Wary Traveller in a Fractius World

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PREFACE

These notes were originally organized during the fall and winter of 1968-1969 as part of an assignment to a committee formed to make recommendations concerning the undergraduate curriculum in the College of Agriculture at Utah State University. A substantial portion of the phrasing of the arguments is not original. However, specific quotations are not indicated in the text. This procedure was not a particular disadvantage in the rush of committee work, but it is no longer feasible to go back and pinpoint each specific source. The best which can be done is to indicate in a general way the sections which have been taken from or influenced by the thoughts of other persons. The beginning section of the first statement is composed mainly of fragments of a lecture by Harold Taylor.\textsuperscript{1} The first section of the second statement is based extensively on comments made in a speech by Edward H. Levi.\textsuperscript{2} Other portions of the first section of the second statement are composed mainly of fragments from Riesman and Jenks.\textsuperscript{3}

The two statements presented were separated by some three months.

\textsuperscript{1} "The Knowledge Industry", Milton Bennion Memorial lecture, University of Utah, October 27, 1964.

\textsuperscript{2} Inaugural address upon accepting the Presidency of the University of Chicago, November 4, 1968.

\textsuperscript{3} The Academic Revolution, New York: Doubleday, 1968, et. passim.
of committee deliberations and are, therefore, probably not wholly consistent one with another.

The committee referred to above issued a report and recommendations that have never been widely circulated; however, the general contents can be inferred from the following list of actions suggested for implementation.

1. Organize the curricula in the College of Agriculture in two divisions -- Agricultural Technology and Agricultural Science.

2. Advisement of students in lower division should be charged to a special group of advisors.

3. An agricultural core program for freshmen and sophomores should be planned as one integrated sequence and presented by a select teaching-advising staff.

4. Upper division students in the two curricula might select an option, requirements for which will be determined by a supervisory staff. In many cases, these options will be oriented across disciplines currently separated by administrative departments.

5. Departmental structure should be changed to coincide with the two curricula described by the committee. Reduction to two divisions would provide more coordinated instruction, stimulate related activities and improve administrative efficiency.

6. Student body quality in Agriculture should be improved by all possible means, including selective recruitment and higher entrance requirements.

7. Alignment of the College of Agriculture and other biological sciences into a single college should be explored.
Committee members were George E. Stoddard (Chairman), Joseph C. Street, John O. Evans, Jerome J. Jurinak, J. LeGrande Shupe and myself. Obviously, these persons are not responsible in any way for the content of my statements.

Allen D. LeBaron
IS EDUCATION INCOMPATIBLE WITH AN UNDERGRADUATE DEGREE IN AGRICULTURE?

The Functions of a University and Education

A university is a community of scholars--students who wish to learn and teachers who want to teach. Thus, the functions are: to teach; to discover new knowledge; to criticize society. The aim is to create wiser men and women, persons who have the capacity to think in terms of abstractions and have faith in their reasoning ability. We want enlarged imaginations and enhancement of intellect. We expect the educated man to be able to accept change and not be frightened by advance of scientific knowledge. The educated person is free from the constraints imposed by complete reliance upon the five senses which, perforce, require continual opting for the status quo. "A university education ought to lead young people to see that there is a moral difference between celebrating intercollegiate virtue by organizing seventy-five thousand strong at Fort Lauderdale and sending sixty students of Northern Universities to help with voter registration in Mississippi."

"Only widely diffused educational opportunities are likely to create a citizenry wise enough to give democracy a chance and thus make it possible for America to be given its chance."

Universities, at least publicly supported ones, also have other functions. They provide varied services to the community at large and they provide training in various skills desired by society. These
functions may be perfectly legitimate and even necessary, but they should not be confused with the purpose of education itself. We must guard against converting the educational system into a mere instrument for producing manpower for a technologically oriented society. There must be balance and an awareness of what is education and what is not.

Some Functions of the College of Agriculture and its Undergraduate Students

I. Students planning to return to farms and rural life. These people are increasingly buffeted by the pace of technological advance in agriculture. They must deal with supplies of capital, marketing, credit, tax laws and marketing orders, personnel management, marketing organizations, and other management problems. Statistics may have limited value to a dairy operator or a cow-calf rancher. What good is 15 hours of chemistry? Management functions are slipping out of the hands of farmers. They are tied ever more closely to supplies of credit; emphasis is on standardized quality and quantity; management supervision is practiced in some commodity areas. Despite this, the same old classes continue to be taught. Where are we training men to be qualified managers for absentee owners or for themselves? What is needed are such things as applied computer courses for the coming revolution in record keeping.

II. Students planning government and industrial careers. These people (with B.S. degrees) often do not work in their areas of training. Companies want flexible, adaptable people who can be trained for the specifics of the job at hand. How does memorization of the name of every plant help here? How can employers place people that are narrowly trained in a single
Ag. college department for four years? What kind of government service can these graduates render to agencies that must face up to the many social problems that surround their day-to-day activities? What relevance is there in a separate course for every row crop? In other ways this question can be repeated throughout the college.

III. Foreign students in undergraduate programs. Luckily we can assume that in some sense the education of these people is not in our hands. We are mainly charged with provision of training and, assuming some curriculum adjustments, this can be adapted to their needs.

Most Effort Must be Categorized as Training

The above listings hint at little which might be termed education (indeed the training component may be out of whack). But is this surprising? Along with engineering, accounting, and education, and others, the demand on agricultural college departments has been for highly trained and not (necessarily) educated people. We may even say this demand has an honorable history. But is it really right to allow students to attend a university for four years, emphasizing training courses, and call the result an education?

(Some students do not really want an education or even a part education-part training experience. They can be handled in diploma courses or in technical schools.)

The surprising thing is that even our training efforts are so weak, mis-directed, and so marked by failure.

Any honest evaluation of undergraduate training programs must lead to the conclusion that most agricultural and other colleges are skewed to the
science oriented student, to the "scholarly" student, to the potential graduate student, in a word, to cloudy images of ourselves. Thus our measurable success is pretty well associated with graduate programs.

On the subject of training, it is clear that not all students need the same things (but a basic program might be some advantage and free resources for flexible response at later stages of student progress). In fact, many of the things which we see intelligent people doing do not require college training; moreover, they often do not require a high school diploma. But this is not the same thing as saying that some education would not prove valuable to such people.

**Education Must Come First**

If we are going to have a university, we have to put education first—training second. This is axiomatic. How can this be accomplished by the college of agriculture?

I. **Curriculum.** We should loosen up course requirements and material presented in all departments. We should make it easier to change majors and switch plans. We should hold electives as open as possible. We must realize that the needs at B.S. level are pretty general. Most students will be required to deal with people and non-agricultural problems, and will need a little technical training (mainly basic concepts—which will help them ask the right questions). Companies will re-train (or some additional courses can be taken for specific farm situations). Sooner or later they are required to become, in effect, public relations men—and this applies all down the line at the B.S. level.
A possible plan is to have no declaration of specific departments for the first two years or at least require no department courses. Background in the "mother" disciplines will be stressed. This will be a flexible process according to best estimates of student post-graduate plans.

We accept the fact that agriculture is an applied field, but this shows up in the training courses which will be taken at the upper division level. Students can specialize adequately during the junior and senior years to satisfy B.S. degree requirements.

Present credit hour requirements in Humanities (and possibly Social Science) should be reviewed, not to particularly cut requirements, but to search out those professors and courses which will truly serve educational purposes. Unless students leave this university with broader views and attitudes than when they enter, unless their very personalities are altered, how can they possibly be said to have acquired any wisdom?

Graduate students do not present much of a problem in the sense of need program changes for training purposes. However, effort must be made to deal more effectively with foreign students seeking Master's degrees. Many of these could follow programs (leading to Master of Arts degree) which would be geared to operating levels of action programs in their home countries.

II. Research. Students should be involved in specific research projects while at the undergraduate levels. This will accomplish two things: (1) they will be searching for answers as they progress through various courses, assignments, etc., and will see some relevance between agricultural problems and course requirements; (2) professors will be
forced to re-design and adapt their research programs to hit at more meaningful problems than is presently the case.\(^1\)

III. Special programs. (1) The role of advisor must be taken much more seriously. Advisors who consistently guide their students to good degrees should be rewarded. (2) Many departments could switch to modified tutorials. Students would be forced to get their thoughts down on paper as a matter of preparation. (3) College or department common rooms could be established for student use and classroom hours could be reduced to free students for common room activities or work in the library or in laboratories. (4) The college (and individual departments) should offer prizes for superior undergraduate student writing and research efforts. (5) A visiting professor program should be set up, sustained and operated so that undergraduates reap direct benefits. (6) Student/professor contact is meaningful only on a bilateral basis. This not too difficult to achieve in the College of Agriculture given many class loads, even so professors are not always seen in their best light as lecturers. There is still room for tutorials, seminars (many interdisciplinary) and advisement are means whereby genuine contacts can be established with individual students. (7) Students have the notion that constant preparation for exams is an education; professors believe they have played the game if they simply give a course examination and never cause students to be tested in some comprehensive way that will measure assimilation and general analytical abilities where a number of disciplines

\(^1\)When administrators ask for College and Station financial support, what kinds of research do they really offer in return? We might well extend the question right on up the line.
are involved. (8) We give too many examinations, too close together. When are students given time for reflection or to gather their wits? Numerous small, medium, and large tests go hand-in-hand with training activities—they are a giveaway every time. Some kind of absolute saturation is reached in mathematics and similar classes that rely upon a test/day in the form of homework.

IV. Staff incentives. One thing is clear: to the degree that anything already presented is utopian, it will remain in that blessed state unless a radical, revolutionary alteration in planning, programming and instituting faculty incentives takes place. As matters stand major administrative questions, and faculty incentives are wound into an ever self-constricting knot around the lower tract.

The College of Agriculture has some natural advantages that could be explored to a greater extent. Student teacher ratios are already low; this implies relatively good opportunities for 1:1 personal communication between students and faculty.
Notes on Academe

What is the situation in which most universities find themselves?

"The American graduate school is the envy of the world. But at the same time graduate training smothers much needed diversity in education, it often fails to link learning and life and has some tendency to belittle its teaching duties."

Some observers, viewing recent developments in university-student relationships, might feel that the "old days" were better. But the truth is that the nation's colleges have never been particularly amiable castles of learning. Most early teachers were non-professionals (often aspiring clergymen or wealthy aristocrats) who saw themselves as policemen whose job was to keep recalcitrant and benighted undergraduates in line. In turn, the faculty was intimidated by domineering presidents intent on imposing their personal stamp on the entire college. The aim of the trustees was generally to promote a special interest, a religion, a social class, a vocation, or a locality. This led to far more disastrous intervention than is usual today. In short, the early history of most American colleges was marked by tyrannical relationships and student protest took on the appearance of peasant revolts.

This situation has been changed drastically by the advent of the research-oriented university. Power has been shifted, in some cases radically, in the direction of faculty committees and department chairmen.
These professional scholars now decide who should be admitted to graduate school and what should be taught there, hold virtual veto power over the selection of their colleagues, and often over the choice of the president. The graduate schools produce homogenized Ph.D.s who, in turn, staff countless colleges that, instead of pursuing distinct goals, increasingly shape curriculum to get their graduates back into the big university grad schools.

Despite the monopolized approach to learning, the growth of professorial power cannot be counted a backward step. No other group in society could have handled the problems better. A learned, professional faculty is clearly preferable to an untrained staff frightened of administrative whims. Scholarship improves when small colleges shed regional and special interest prejudices in search of an objective and national outlook. Acceptance of scholarship as an ideal has meant that student admissions are related to academic achievement rather than to wealth, favored prep school or alumni ties (professors may have a preference for talking to the already converted).

Still there are obstacles to education. In many regions the expansion of enrollment and merit admissions have not really helped children of low income families break into higher social brackets via educational opportunities. Most added room has been taken up by lower-middle-class students whose families now consider college more necessary for jobs. The poor are not blocked by costs, since jobs, loans, and scholarships will get any wholly committed student through college. The primary obstacle is that the overriding interest, especially in small colleges, is to create a
smooth and glossy campus atmosphere, not in serving a large, remote and often ungrateful abstraction called "society."

Again the chief villain is the graduate school which controls the direction of undergraduate training and is both introspective and oblivious to broad social needs. The system is dedicated to training men to write papers rather than to communicate with students. Often research exhibits no genuine concern with answering real questions or solving important problems. Graduate schools have solidified knowledge into disciplines in which "like minded men created a system for remaining like minded."

Conflicting good and bad forces are to be observed at work on students. Disquieting and rebellious students may help quite a bit if they continue to demand more relevant education. "At the same time the amount of absenteesim, indolence and incompetence permitted students exceeds that of nearly any other sort of worker. The majority of students who enter college are plainly more concerned with accumulating credits and acquiring licences than with learning any particular skill." They have no feeling about the usefulness of becoming more learned.

Choosing a Path for the College of Agriculture

These thoughts suggest something of the general nature of our existing situation and, in addition, suggest something of the future if present trends and methods are not revised. Obviously, new or altered goals are needed; unfortunately they are not easily come by. Four main options seem open: The first is to refine and improve the present system of undergraduate training, recognizing the special needs for science oriented students and in essence creating a more viable two track system; The opposite extreme is to abolish the college of agriculture; A third
and somewhat less visceral measure is to abolish undergraduate teaching; and the fourth is to drastically revamp the undergraduate curriculum in favor of courses and activities which cannot be narrowly defined as merely training.

Abolishment of undergraduate teaching or the College of Agriculture implies a wholly graduate (science) student orientation. Ignoring any political repercussions, the practicality of either course of action depends on the department in question. Difficulties would be minimal for pre-vet or for soils and meteorology. They would be at their worst in the cases of dairy science and agricultural economics. In these latter cases, "industry demands" need to be met at more than one level. Ignoring farm management, there are many opportunities that do not require maximum professional capability. Upon reflection, it is apparent that most "intermediate" training needs tend to be linked more or less directly to "management positions." The need for fully trained scientists, which must be met by all departments, can be satisfied only by graduate training.

Thus, we are led to consideration of the "dual track" solution. Ordinarily management needs simply do not require backgrounds which are thought to be pre-requisite for scholarly, scientific research. Even if student interests would support such an approach, there would be inadequate time to impart necessary management and business skills for those not intending graduate work.

Emphasis on needs of industry of society is hard to overcome. In fact, some clever persons have even argued that most of our educational choices can be explained by the existence of the market for various skills.
And while it is difficult to ignore the fact that the history of state supported institutions is marked by production of "commodities" for a demanding market, a more utopian view of education has considerable appeal.

Such a view rejects much of the emphasis on direct training to satisfy career needs. Instead, stress is upon the value of education for education's sake. Such a view is at least partially responsible for the claim that "what many companies want in a first degree is a liberal education." All kinds of examples can be drawn from European experience to show that individuals study subjects almost wholly without regard to what will sell in the career market place.

Of course it may be argued that such examples really are related to an educational elite and that science-oriented schools, such as Cambridge, turn out engineers and natural scientists who are somewhat limited in outlook. If this were not the case books such as The Two Cultures would never have been written. Actually the European system is a compromise. For example, a lot of education takes place in gymnasiuums and grammar schools prior to a person's entering a university. The system of tutorials, common rooms, etc., the student unions and several hundred clubs on each campus, and the so called "oral tradition" play extremely important educational roles. It is possible to imagine the benefits from a similar compromise in the activities of technical colleges on American university campuses. But these institutions are details. What first is necessary is a consideration of the gains and losses which might result from adoption of the utopian view.
If we accept the notion that graduate schools are mainly intensive training centers (Dean Gardner, "The Role of Graduate Students," Ag. Coll. Seminar 30, Jan. 1969), then it seems that a great deal of care must be taken to insure that undergraduate degrees truly offer a chance for a broadening educational experience. At present, an attempt is made (at the all-university level) to achieve this result by requiring "group filling" studies of all students. It is possible that this is as much as can be expected in circumstances where many students have little feeling about the usefulness of becoming more learned and have no appreciation of what it means to escape the world of the uneducated. For it is certain that the majority of undergraduates only effect a partial escape, and this after four years of exposure to "higher education"!

That this is a general result is evidenced by the growth and introduction of honors curricula, overseas semesters, etc.

Few would argue that all students could benefit from the honors treatment, but, at the same time, merely filling groups is not too exciting. Maybe what is needed is for professors in the science colleges to lead and guide undergraduates into a greater number of educational experiences. Too much emphasis is placed upon preparation for successful graduate study.

In the College of Agriculture, for example, if it is possible to create certain general theory courses for all students or for science oriented students, some time should be available for college operation and presentation of lecture courses and programs which would insure all students' abilities to deal with the realities of their own natures and with a complex, technologically oriented world. Agriculture has all too obvious social
aspects that range from an understanding of the world food needs to estimations of impacts on rural America as the farm population diminishes. Certainly there also must be humanistic and even artistic aspects to agriculture that would provide all sorts of new insights to the youth we teach. It is possible to speak of a history of agriculture and it may even have a literature too— who knows, until some professors are willing to make the break?

Our students don't need a laboratory course in chemistry nearly as much as they need a course in what chemistry [science] is. What about logic?

If it is impossible for the college faculty to really devote a major effort to such a program, another course of action is open. Let students spend essentially all their first two or three years "across campus," but retain direct supervision over them during the whole period, requiring seminars, written reports, and tutorials to monitor progress.

Meanwhile, most of the departmental divisions in the College of Agriculture can be broken down as far as actual agricultural courses are concerned. In some cases, it is possible for certain students to be allowed to engage in some research phases while still undergraduates. Various faculty members can be assigned liaison teaching, and research positions between departments.

All of this is not necessarily incompatible with the dual track "solution." It merely means that the dualism is put off to the junior and

\[2/\] We need to consider the lives of great scientists, which experiments were critical, why the questions asked were relevant, etc. We need to expose them to the role of inference in the natural sciences and where are the philosophy requirements?
senior years. It also means that students would have a better foundation for making a science or non-science choice when a decision becomes necessary. This program is consistent with the notion that a university degree should be directed to educating the whole man, so that his interests and sympathies will be broadened. He should be taught general analytical skills and the facility for acquisition of particular information when and as he needs it in the future.

This also suggests a new look at resource allocation, and in this our actions, at least initially, may be somewhat constrained. In effect, much of the money utilized in the College of Agriculture is so earmarked for training purposes that the task may seem nearly hopeless. However, by reducing certain course offerings, by combining and coordinating instructional efforts, and by more careful structuring of research goals and methods, some maneuvering room should be obtainable not only with respect to resident instruction funds, but within Experiment Station budgets as well. In this connection it is well to reflect upon the role that research monies themselves have played in graduate instruction and goals, and thus upon the undergraduate programs which have been the main concern of what has been written so far.

Closing the Ring: Back to University Aims and Methods

"The tasks which university faculties have undertaken, sometimes within and sometimes without the universities, should not obscure the fact that universities exist for the long run. They are the custodians not only of

\[3/\] There is an argument for putting off all specialized "science" training until graduate work is begun.
the many cultures of man but of the rational process itself. Universities are not neutral. They propagate a special point of view; namely, the worthwhileness of the intellectual pursuit of truth. This view does not remove universities from the problems of society—there must be interchange of ideas which remake the world. But the point is that the search for truth undergirds every other strategy on behalf of constructive social change.

"Some are impatient with this system even though in a few areas actual implementation has been made an appropriate part of training and research. This may not be enough for those who would prefer a different way of life. Nevertheless they stay within the educational system caught by its pretense and rigidity. In fact, they feel they must stay a long time. Not only has the number of years required for formal education steadily increased as college and graduate work are treated as necessities, but there is pressure for total absorption of the student's interest either in the curriculum or in auxiliary activities. We are set on a course which suggests that every young person up to the age of 25, every young family really, should have an educational institution as a surrogate for the world. Quite apart from the fact that institutions of higher learning should not be surrogates for the world, the satisfaction with which this development is greeted should be tempered. Much of this is distorted due to the Selective Service System. In addition, much of the work in graduate schools is unnecessary, or even worse, is disqualifying for professional work, as for example the undergraduate teaching for which it is required. There may be disagreement, but for some years it may be doubted if the extended time
can be justified as a reflection of an increase in knowledge. It may be an unimaginative response on the part of universities to the existence of increased leisure time within the economy.

"If the goal of a college education for everyone is to be met in a way to do the most good, the purposes and ways of that education, even the periods of time involved, should be re-examined. This has been done before you say, well it still might not hurt too much to take another look. For those interested in pioneering there is much to think about."

It is exciting to imagine that the faculty of the College of Agriculture might continue to fulfill their responsibility of protecting on one hand the freedom of the individual scholar, and shepherding at the same time the development of a revised undergraduate educational program. The burden must be upon the faculty, for it has been said that "there is no substitute for the clash of mind between colleague and colleague, between teacher and student, between student and student...it is here the half-formed ideas may take shape, the groundless beliefs be shattered, the developing theory be tested...it is here the controversy develops, and out of controversy, deeper understanding." Today where there is doubt and skepticism concerning the very tradition of intellectual freedom and integrity upon which the intellectual pursuit of knowledge is based, it is urgent that the college and the university through its faculty meet these questions head on.