A CRITICAL STUDY OF THE HORTICULTURAL CURRICULUM OF THE MICHIGAN STATE COLLEGE

Thesis for the Degree of M. S.

Luke Harry Kelly

1928

THESIS

Michigan state college of agriculture + applied science — Curricula

Title. Horticultural curriculum of the Michigan state college

1 Horticulture

A CRITICAL STUDY OF THE HORTICULTURAL CURRICULUM OF THE MICHIGAN STATE COLLEGE.

Thesis

Submitted to the Faculty of the Michigan State College of Agriculture and Applied Science in partial fulfillment of the requirements for the degree of Master of Science.

Approved June 4, 1928
V. R. Gardner

by

Luke Harry Kelly.

June 1928.

THESIS

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INTRODUCTION

The four year curriculum outlined for students majoring in horticulture at Michigan State College, in common with corresponding curricula in similar institutions, includes a number of courses in general science, some in liberal arts, and some of the basic courses in the several agricultural sciences, as well as more specialized courses in horticulture. The exact courses that are included in such a curriculum generally represent a compromise between what, at least theoretically, it seems desirable or practicable for the student to take within the time limits that are available. They may also represent a compromise between the conflicting opinions of those who are responsible for the outline. The elective or optional courses that the student chooses during his last one or two years sometimes reflect his own opinion of what will eventually be of greatest use, sometimes they simply reflect his choice of what is of greatest passing interest. Regardless of how the required courses of the curriculum are decided on and regardless of the factors governing the students' choice of electives, it is largely opinion that shapes each individual student's course of study. Comparatively few data are available which tell either faculty advisor or student how well or how poorly any particular curriculum or

course of study will prepare the individual for his future vocation. Perhaps this is not surprising when it is realized that the indirect may often be as great or greater than the direct benefits to be derived from a particular course of study, and possibly from this standpoint any and all courses of training are to be regarded as valuable. On the other hand, it would be even more surprising if all courses would turn out to be equally valuable. Some must be better than others and, following the same line of reasoning, it is probable that in almost every curriculum there are weak spots.

STATEMENT OF OBJECT

It is with the idea of determining how adequately or inadequately the horticultural course as given at Michigan State College in the past, has met the needs of its graduates in their respective fields of work, that a critical survey has been made of the horticultural curriculum (using this term in its broader sense) and an attempt made to locate its strong points and its deficiences.

METHOD OF PROCEDURE

A questionnaire* was sent to 94 horticultural graduates.** For comparison similar data were collected by means of personal interviews from 40 graduates of liberal arts colleges, professional schools, and from other departments of land grant colleges. Nine of these were farmers, seven extension workers, five high school teachers, three county agents, three graduate students, two physicians, two dentists, two ministers; there was also one representative from each of the following vocations: farm wife, insurance agent, retired commercial veterinarian, real estate salesman, osteopath, and Y.M.C.A. secretary.

* Sample on pages 2, 3, 4
** Seventy of these questionnaires were returned with data.

QUESTIONNAIRE

If there is not room after the question for all you wish to say write on the back of the sheet.

Name----------Address----------

Positions held after leaving college:-

1.----------

2.----------

3.----------

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4. Position held at present.----------

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5. Have you ever taken Post-Graduate work?----------

6. Where----------What degree----------

7. What course or courses e.g. (Botany, English, Soils, Farm Crops, Mathematics) that you took in College do you value most highly from the standpoint of the general training that they gave you--a kind of general preparation for the work that you have been doing, though you may not have been able to make direct specific use of its subject matter?----------

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8. Since leaving college have you taken any specific courses of instruction along these lines--e.g. correspondence course, short courses, etc.----------

9. What course or courses that you took in college do you value most highly from the standpoint of <u>specific information</u> that they gave you that you have since been able to use more or less directly in your work?

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10. Since leaving college have you taken any specific courses of instruction along those lines--e.g. correspondence courses, short courses, etc?----------

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11. If you had it to do over again, what subjects would you take that you did not take in college or along what lines would you take additional work, having in mind that you would remain in the same occupation? Why?----------

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12. As you see it where was the weak spot in the course that you took from the standpoint of realizing your ambitions after leaving college?----------

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13. As you look back upon your time spent in college, did you get more out of the time spent in laboratory or classroom courses? How do you account for this?

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14. What do you consider the most satisfactory way or means of keeping up-to-date and supplementing the fund of information which you get in college?----------

15. How much travelling have you done recently, primarily from the standpoint of adding to your professional information?----------

16. Do you subscribe for and follow rather closely any professional magazines as e.g. American Fruit Growers, Market Growers Journal, Chicago Packers, etc?--------

17. What non-professional magazines do you read regularly, e.g. Saturday Evening Post, Cosmopolitan, etc?

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18. Are you on the regular bulletin mailing list of your own and other experiment stations?----------

19. Have you found it necessary to purchase recently published professional books? Give the titles of some of them.----------

20. Are you a member of any professional organization such as, State or Local Horticultural Societies, Garden Club, etc?----------

21. Are you a member of any general farm organization such as, Grange, Gleaners, Farmers' Clubs, Farm Bureau, etc?----------

PRESENTATION OF DATA

Present Occupations of Horticultural Graduates

Fourteen, or 20 per cent, of the horticultural graduates of this group of 70, returned to the farm and presumably are growing horticultural products. Twelve, or 17 per cent, are engaged in horticultural merchandising enterprises.

Production	********** 14	20 %
Marketing	********** 12	17
United States D. of A.	********** 11	16
Horticultural Teaching	****** 6	9
High School Teaching	****** 6	9
Not related business	****** 6	9
Related Hort. Selling	*** 3	4
Advertising	*** 3	4
General College Teaching	*** 3	4
County Agents	** 2	3
Others	4	5

Fig. 1.- This figure shows the different fields of work in which we find the 70 horticultural graduates engaged.

Eleven, or 15.7 per cent, are in the service of the United States Department of Agriculture. In the field of education, we find six horticultural, six high school, and three general college teachers. Only 8.5 per cent are now engaged in pursuits not related to horticulture.

Changes in Positions

Eleven of the horticultural and seven of the non-horticultural men are still on their first jobs. Thirty-six, or 51 per cent, of the horticultural men, in comparison with 11, or 27.5 per cent, of the non-horticultural men, have held four or more positions since graduating from college. Many of these changes in positions can be accounted for by advancement with the same company or in the same field of work.

Advanced Professional Training

Fifty-seven of the 70 horticultural graduates have never taken any advanced college work; only 13, or 18.6 per cent, have returned for advanced professional training. In contrast to this it was found that 57.5 per cent of the non-horticultural men interviewed have found it desirable to do graduate work.

Table 1.-This table gives the relative percentage of horticultural and non-horticultural graduates who have taken graduate work.

	Horticultural	Non-horticultural
Number investigated	70	40
Per cent without Graduate work	81.44	42.5
Per cent with Master's Degrees	12.85	35.0
Per cent with Doctors Degrees	5.71	5.0
Per cent with advanced training not otherwise designated	-----	17.5

Courses Valuable for General Training

Figuring on the basis of five subjects a term, a graduate has taken in the neighborhood of 60 term subjects. Some of these courses have been cultural in their nature and others have been primarily technical. After having taken such an assortment of subjects, it would be interesting to know which have been of the most value from the standpoint of general information, and which from the standpoint of specific information, for both horticultural and non-horticultural graduates.

Data on this question, as furnished by the questionnaire, are summarized in the following figure:

Botany	********** ******	38
English	**********	32
Mathematics	**********	17
Chemistry	**********	16
Bacteriology	**********	15
Economics	**********	13
Entomology	**********	11
Physics	**********	10
Soils	********	8
Farm Crops	******	6
Psychology	******	6
Political Science	****	4
Animal Husbandry	****	4
Public Speaking	****	4

Fig. 2..-Showing those subjects which horticultural graduates consider have been the most important from the standpoint of general training.

It is obvious that horticultural graduates consider their Botany and English courses the most valuable from the standpoint of general training. Furthermore, when these graduates are divided into groups, according to the

general nature of the work in which they are engaged, the same statement holds for each and every group. It is interesting that one of these subjects is classified strictly as a liberal art and the other as a pure science. The Production Group (i.e. those engaged in production enterprises) of 15, and those engaged in educational work (28 in number) consider chemistry as the next most important subject that they took in college. On the other hand, those who have entered the merchandising field (19 in number) apparently have found their knowledge of chemistry of comparatively little value. They are inclined to rate public speaking and economics as of greater value.

The non-horticultural graduates also think that their English courses have been the most valuable from the standpoint of general training. They give botany and chemistry as second choice.

Courses Valuable for Specific Information

General horticulture together with specific horticultural courses have been listed by the horticultural graduates as being most valuable from the standpoint of furnishing specific information that they have used. Botany courses have been listed

second and entomology third. Bacteriology, chemistry, soils and surveying have also been of specific value, although to a more limited group.

Botany	**********	28
General Horticulture	**********	25
Entomology	**********	18
Bacteriology	**********	14
Chemistry	**********	10
Plant Pathology and Physiology	*********	9
Soils	********	8
Systematic Pomology	*******	7
Landscape	******	6
Horticultural Marketing	******	6
Surveying	*****	5
Plant Propagation	****	4

Fig. 3.- Showing those courses that horticultural graduates took in college that they have been able to use more or less directly in their work since graduating.

Dividing the horticultural graduates again into Production, Commercial and Educational groups, it was found that horticultural courses, botany, entomology, bacteriology, and soils were of most direct value to all groups of graduates. The courses in soils have been

especially valuable to production men, and commercial horticulture to commercial men.

Subjects Horticultural Graduates Would Elect If They Were To Take The Course Again.

The four year college curriculum affords the student a chance to select a number of specific courses which he believes will be of greatest benefit when he begins his life work. At the time, few students are really able to anticipate their needs and years later many graduates realize that some subject that they did not take would be of great value.

The graduates, from whom information was collected, were asked what subjects they would take more work in, if they were to go through college again. A considerable number stated that they would elect such general and cultural subjects as English, public speaking, and economics. It is interesting to note that the present horticultural curriculum requires little, if any, more English and public speaking than was required of horticultural students one or two decades ago. However, economics courses have been added to the curriculum and now no graduate leaves the institution without some conception of the fundamental economic principles; furthermore it is now possible for students who have a liking for

economics to take a number of advanced courses as electives.

Mr. Paul Thayer, a fruit grower of Cumberland County, Pennsylvania, apparently reflects the opinion of a considerable number in the following statement with reference to his idea of the necessity of training in economics.

"In college we did not get the economic side taught, as it is necessary for the student to understand in order to succeed as a farmer or fruit grower. These economic principles are essential whether the graduate is to farm or to act as teacher or advisor of present or future farmers. Knowing how to produce crops is valuless unless the production is carried on under conditions which render production remunerative."

Other horticultural graduates would elect more work in chemistry, business administration, plant pathology, botany, languages, bacteriology, mathematics, physics, and farm mechanics, though these subjects received less frequent mention than English, public speaking and economics.

The preferences indicated by each horticultural group when divided on the basis of present occupation, are English, public speaking and economics. Members of the Production Group are the only ones that would elect farm mechanics. The Commercial Group mentioned chemistry and foreign languages as being desirable. Besides the three subjects mentioned above the Educational Group

would take more chemistry, botany, bacteriology, physics, and school administration. The non-horticultural graduates would take more work in sociology, economics, bacteriology, botany, history, psychology, education and English.

Weak Spots in College Course

In answer to the question "As you see it where was the weak spot in the course that you took, from the standpoint of realizing your ambition after leaving college," nine mentioned that they did not have enough "practical farm experience." Some of the nine thought that it might be advisable to require at least one summer's work of each candidate for graduation in his specialized field. This experience would not only give him a broader view for his last year's college work but might prove to be of great value to him when he tries to fill a position later on. Each of the following statements was mentioned six times as being a weak spot: " poor training on management or business side of farming," "lack of marketing courses," and "did not take public speaking." The fact that horticultural courses were "too general" was stated by five persons. Both " lack of vegetable gardening and small fruit training" as well as "fundamental courses for nurserymen"

seemed weak spots to three. A like number claimed that the greatest deficiency from their point of view was in "not knowing what to expect when they got out."

One man said, "The course was not weak--it was the lack of my appreciation of what I needed as a college student."

Another graduate, engaged in commercial work at Boise, Idaho, has written as follows on this question:

"The biggest weak spot is probably not knowing what to expect when leaving school, that is why I thought my association with Eustace was so valuable. I, and I believe most other students, had no idea of what we could follow up after leaving school, and just took anything hoping it would lead to something. It would seem to me that the history of fifty or one-hundred students after leaving for ten to twenty years would be valuable. I believe an hour course per week, or two hours a week for juniors or seniors as to what they can expect from such a training is needed as much as anything. Take fifty or one-hundred histories of students and trace them along, to see what they had to travel to get where they are. I believe that if the student thinks about what he expects to be ten or twenty years after leaving college, he would study differently, not only while in school but after he gets out and gets on his job.

"In other words where does a job with a brokerage company lead to years afterwards, the same with teaching, the same with experiment station work, or anything else.

"I used to wonder what it was all about when I was in school and stay awake nights worrying about where I was going, and the same with others that I knew, about the same as a young girl does before getting married. I believe you should put them wise as to what to expect, so they can plan and not get off on some tangent and take years to get back where they belong.

"I feel I am where I should be, and very happy in my work, and making more money than I ever dreamed of, yet I don't feel I came this way because of my training, I just arrived here by luck, that is the way most lives are started.

"I remember very well working with Paul Armstrong, Francisco, Mogge and several others in our classes when we first got out of school, and we had no more idea of our future than a laborer. These men have made good, but they were not directed in their respective channels by school training.

"Think of the large number of others in our classes that are just making a living, and working in places where they dislike the work, probably because they were not directed into the right kind of work.

"Professor Eustace did more of this work than any Professor I ever heard of, and I believe you will find more successful horticultural graduates during his teaching than any class of men from the school. It seems that way as one goes about the country meeting and talking with graduates of our days."

Laboratory versus Classroom

The survey revealed the fact that apparently there was no choice in the minds of the horticultural graduates between the value of laboratory and classroom methods of instruction. Several qualified their statements to the effect that the success attending either method of presentation depends largely on the instructor and the type of course. Certain courses lend themselves readily to laboratory methods and others if taught outside the classroom are not likely to fulfill satisfactorily their objectives.

How to Keep Up To-date

Forty-seven horticultural graduates use state experiment station and United States Department of

Agriculture bulletins and circulars to keep informed. In fact 46 graduates stated that they were on the regular bulletin mailing list of at least one state experiment station. Twenty-three read periodicals; nineteen recommend "joining a society in one's chosen field;"nine take trade papers, and an equal number have recently purchased technical books. Seven advise attending educational meetings and lectures; five profited by visiting up-to-date fruit growers. Four have found time to travel, and the same number state that they appreciate the value of personal observation; only two, however, mention taking graduate work.

The non-horticultural graduates find that "continued training" is their best method of keeping up-to-date; with this exception, the methods they used are about the same as those mentioned by the horticultural graduates.

Professional Magazines

The "American Fruit Grower" and the"Chicago Packer" are the two leading professional periodicals read by horticultural graduates. They were mentioned 16 and 17 times, respectively. The "Rural New Yorker," "Fruits and Gardens", "Better Homes and Gardens", "Market Growers' Journal", and "California Citrograph"

were each mentioned about five times. The non-horticultural graduates have not confined themselves to any one particular type of professional reading because of their diversity of vocations.

In totalling the number of professional magazines for both groups, it was found that the horticultural graduates averaged 1.25, while the non-horticultural group averaged 1.5 magazines each.

Non-professional Magazines

"The Saturday Evening Post", "American","Literary Digest", and "National Geographic" are the four most popular non-professional magazines with those from whom information was secured. This is true for both horticultural and non-horticultural graduates. The horticultural graduates were found to read on the average 2.4 non-professional magazines and the non-horticultural group averaged 2.5 magazines apiece.

Books Recently Purchased

Twenty-nine horticultural graduates stated that they had made no recent purchases of professional books. Several stated that they had made some purchases but failed to give any specific titles. The titles of books

purchased and the number of times each was mentioned are shown in Table 2.

Table 2.-Titles of books, and number of each recently purchased by horticultural graduates

"Fruit Growing", Chandler	6
"Fundamentals of Fruit Production", Gardner, Bradford and Hooker	4
"American Fruits", Fraser	3
"Encyclopedia of Hardy Fruits," Hedrick	2
"Citrus Diseases and Their Control," Fawcett	2
"Fertility and Crop Production," Cox	2
"Manual of Fruit Insects," Slingerland and Crosby	2
"Cyclopedia of Horticulture," Bailey	1
"Plant Biographies"	1
"Citrus Culture," Hume	1
"Railroad Train Service"	1
"Freight Rates"	1
"Design of Small Properties," Bottomley	1
"Manual of Plant Diseases," Heald	1
"Rural Life at the Cross Roads,"	1

Twenty-seven and one-half per cent of the non-horticultural graduates have not recently purchased books, in comparison with the 41 per cent of the horticultural graduates. The books the non-horticultural

group have purchased varied in type as greatly as their choice of professional magazines.

Membership in General Farm Organizations

The Farm Bureau has enrolled larger membership among the groups investigated than any other general farm organization. Fourteen horticultural and eight non-horticultural men stated that they were members of this organization. The Grange, which is the leading social order among the farmers, has attracted 11 horticultural and 10 non-horticultural graduates. The other organizations such as Gleaners, Farmers' and Community Clubs have but one or two representatives in either group. Forty-five horticultural and 13 non-horticultural graduates indicated that they do not have membership in any general farm organization.

Membership in Professional Organizations

Twenty-two, or 31 per cent, of the horticultural and nine, or 22.5 per cent, of the non-horticultural graduates do not possess membership in any professional organization. The Michigan State Horticultural Society leads the field with 26 horticultural graduates

as members. Seven belong to the American Society of Horticultural Science. Four of the non-horticultural graduates are members of the Michigan Education Association but all other professional organizations have failed to attract more than three from either group of graduates.

Considering the diversity of occupations of the horticultural graduates, and the number of positions each has held since leaving college it is safe to assume that some of them have had a broad experience in one or more fields of work. One of these graduates, Mr. Edwin Smith, '12*, stands out as having had an unusually varied career. During his years of experience he has formulated definite ideas concerning his college course and college courses in general which he has carefully put into writing as a supplement to the answers of his questionnaire. Because of the thoroughness with which he has reviewed the entire subject, Mr.Smith's "Notes on a College Education" is being quoted here:

"After fifteen years away from M.A.S.C., mostly in contact with all sorts of men with all sorts of educations, I have come to the conclusion that if I were advising a son regarding his college education I would influence him toward taking his work in a University or College where he could secure a good Liberal Arts training, where he might secure a real, substantial grounding in Sciences along with his cultural subjects. Then he might go to his Professional School and secure

* Specialist for U.S.D.A. in Marketing, Fruits, Vegetables, stationed at London, England.

his training in Agriculture, Medicine, Law or Theology,- or plunge into Business, as his inclinations may direct.

"By doing this he would have such an education as he will not have if he rushes helter-skelter into the professional courses with only those necessary preparatory subjects requisite to his properly digesting his professional work,- as I did from 1908 to 1912 at M.A.C. With such a foundation a student might master his horticultural subjects, if he choses to become a fruit grower, in a comparatively short time,- part in college and part on a fruit farm. If he desires to become a professional horticulturist, in these days he will want his graduate work for a Doctor's degree, or its equivalent, so that the four years that are spent on what might be termed more or less pure academic subjects will be just like money deposited in a bank for him, as well as a joy and satisfaction all the days of his life.

"From these remarks it is to be seen that I am critical of those who would map out a course of study in college which would simply be efficient in turning out graduates equipped to earn a living at some vocation which college graduates are supposed to follow. I am critical of those who would map out a course that would make it possible for the student to "realize his ambitions after leaving college", simply for the reasons that those who can afford to take the time for a college education should want something more than an apprenticeship and that while we are in college our ambitions are not what they will be ten years after. In criticizing the college course that I pursued I should prefer to do so from a more comprehensive viewpoint than that of Horticulture alone. In following the horticultural side of my work since leaving college I have been under a greater handicap through the inadequacy of my academic training at college than I have been through the shortcomings of the Horticultural Course which I followed.

"Courses For General Training: Most students graduating from college should want to take some part in the civic life of their community and add a contribution to society, quite outside of their professional activities, which their position in life makes it possible for them to do. It may be their County Board or Council, the State Legislature, the National Legislature, or in many of the Service or Fraternal Organizations woven into the American national fabric. English and History were about the only two subjects which I took at M.A.C. which have helped me along that line. Then, I did not know that I

should ever need any such preparation. I should have had much more Modern History,- especially thorough courses in American History, of which I had none at all. I should have had courses in Literature, Psychology and Philosophy, Political Economy, Art Appreciation, Music Appreciation and History of Religion. Though my work has not taken me into channels of Political nor Religious work, I may confess that my life since college has seriously felt the deficiency in this side of my education at college.

"Many students are coming to M.S.C., raw off from the farm, just as I did. They have no conception of what is there for them if they only knew how to take hold and find it. They have no idea as to what a real library is, what a store of wealth is there for the taking, nor how to find it. Many have no incentive to find out what there is in a library. During many hours of the week they loaf even as I loafed. They laze around their rooms during the evening, talking a lot of piffle, even as I did in Old Williams Hall and in Wards A and B of Wells Hall. I regret that loafing now; not but what I think pleasantly of those hours nor that I can see myself with my nose in a book all of the time that I was draped over a bed or a table in some other fellow's room. But what I do regret is that we were not more stirred up to be interested in some of the more important things that go to make up a general education, and that during those hours we were not exercising our brains discussing what we had read or heard under those topics instead of talking just plain piffle.

"I think that in the freshman year that there should be a lecture course, handled by the most magnetic and inspiring personality in the institution, on a subject dealing with what there is in college outside of classroom. I would have this a required course for all students entering the four year courses, I think another lecture course that should be valuable during the freshman year would be one on Education, so that the girls and boys who are as fresh out of the country as I was newly away from the soil, may not get the idea of an education confused with credits, required subjects, making A's from certain instructors or getting flunked by others or, as a matter of fact, getting education mixed up with the great desirability of having the Bachelor's degree at the end of the four years. Most of us, at an early period in college, got it well straightened out in our minds that all of our college education was not to be secured in the classroom. I think nearly all

of us went right straight through college and passed out into the world with a stirring feeling of elation that we had early made that great discovery. But I do not remember any of my immediate associates who felt that there was any compunction about not following some subject or subjects to greater lengths than the instructor required. To have done so and to have gone deeper into a subject than the instructor (though we sometimes sensed that that would not be very deep) would have been a matter of scandalous discussion. Few of us would have appreciated that such digging after knowledge was just the A B C of securing an education.

"On The Courses For Specific Horticultural Information: I cannot blot out any of the Horticultural courses which I took as not being of value to me in my work. Possibly the courses in Gardening and some in Greenhouse Practice may not have been called upon to any extent in my particular occupations during the past fifteen years, but I should not like to have been without them and the associations with those who taught them. They have been of much satisfaction to me through there becoming associated with and becoming familiar with plants. My horticultural course could have stood more general courses wherein I should have secured an intimate acquaintanceship with plants,-many,many more plants.

"In my particular work Physics has played an important part, so what little Physics secured at M.A.C, has been very useful. Unfortunately we had a very poor course in Physics while I was there. That course should be specially adapted to the use of Agricultural Students,-going into the fundamentals of those branches of the subject which apply to the different agricultural courses. Of course Refrigeration and Electricity are the two phases which appeal to my mind.

"The course on Horticultural Literature is a very valuable one, but should be early given to the students who specialize in this subject. Required readings and research in Bibliography along certain subjects should early train the student the way in which he can unearth certain lines of information for himself.

"Practically all who graduate in Horticulture will find a good grounding in Soils to be valuable. This was one of the weak spots,-very weak spots,-in my course.

"My training in Botany at M.A.C., has always been a very regrettable failure. I attribute this to the attempt of Dr. Beal to use methods of the graduate student with undergraduates. I regret the time which I unwittingly squandered in many of the laboratory periods of my early Botany courses. I had no idea as to what I was to look for nor what there was to see. I once asked the instructor if there was not some text book wherein I could read up on what I was supposed to find. I received the curt reply that there was no text book on what I was supposed to see in the plant itself. I look back upon those courses as the "dumbest" courses of my college career. They should have been the most interesting and among the most valuable. Later courses were more appreciated, though Plant Physiology might have been better adapted to my specialization in Horticulture.

"Bacteriology was among the most satisfactory courses taken. Classroom work was well balanced with laboratory work and there was no lost motion. We were inspired with a real interest in our subject right from the start and we received a training that has lasted.

"Weak Spots and Regrets: Our instruction in Economics as applied to Agriculture was nothing short of scandalous. When I graduated from college I was as innocent as to the difference between a Bill of Lading and an Invoice as a new-born babe is between the Magna Charta and Mendel's Law. Board's of Directors, Traffic Managers, Railway Tariffs, Bank Drafts, Insurance Policies, Auditors, Preferred Stocks, and Demurrage Charges were all terms that were beyond my horizon. I cannot now conceive how a group of intelligent men could plan a curriculum and omit courses which would give the college student a glimpse into business organization and practice. The fact that we did not have such course but that we spent long hours on a carpenter's bench and blacksmith's forge shows that we were still in the transition period from the time when the students chopped down the trees, dug up stumps out of the campus and hoed in the corn field, even though we really felt ages removed from those pioneering days. And I greatly enjoyed my "manual training", Woodshop and Forge, too. It was easy for me and I made some pretty things, but the courses have been about as useful to me as were some of the Midnight Freshman Rushes. They were courses suited to Winter Short Courses. But what graduate does not have occasion to speak intelligently or to act wisely in connection with business organization these days? What student would not have been benefited by a knowledge of Cost Accounting?

"Meteorology was an elective course which I did not elect. It should be a required course for all Horticultural Students.

"Of all the courses which I decided would be useless to me after I graduated, Foreign Languages were nominated with the greatest degree of certainty. I did not plan to do pure research work nor did I anticipate having money enough to travel widely in foreign lands. Consequently, I had absolutely none of them. But observe how farsighted a general the college student is of his destiny,-for the past four years my work has been centered in all of the countries of Western Europe, and as far East as Hungary and Serbia. As a result I advocate that German and French be studied in High School and that one of them should be followed up in college.

"We were not well grounded in the Fundamentals of Research and I regret not having had a course along this line. I think such a course would be valuable to the graduate who goes into practical fruit growing because some of his problems involve principles which the research worker will require. It would cause many students to decide early whether or not they wanted to specialize in research work and how to best prepare themselves for that work. It should give the student a better basis for individual thought on Horticultural problems.

"This brings me to one of the most serious criticisms of my college course and I think it is possibly a criticism of the American College quite generally, of my time and immediately following, if not at the present time. We were not trained to do individual thinking as we stood on our own feet. We went to college expecting our knowledge to be served to us like table d'hote dinner, and it was done just that way in so far as the faculty were able to do it. When we finished we had our ideals all wrapped up and tucked away just about as the faculty thought they should be wrapped up and tucked away. There was very little controversy between students or between students and faculty. Our professors were supposed to have absolute knowledge. Our confidence was approaching the perfect.

"As an example of this I recall the classic theory on Clean Cultivation of orchards. There were no two ways

about that when I finished my course in Horticulture. The Rural New Yorker still held up the theories of Grant Hitchings, but we were of the opinion that The Rural New Yorker was an Old Fogey sheet and that Grant Hitchings had a farm that was an exception. "Look at all of the up-to-date orchards in Western New York, Southern Michigan, while out in Washington and Oregon they consider it a disgrace if even a weed is seen in the orchard," so we said. In 1913 I saw the orchards in Wenatchee for myself and they were so. Had we any grounds for being so smug and content with this ready-made piece of horticultural doctrine? Hardly, because today at least 90% of the apple orchards in the State of Washington, having the heaviest production of any orchards in the Union are under mulch culture and are not plowed from one year's end to the other.

"We would have been far better off if our attention had been directed to the principles involved with an allowance for discussion on the subject. We were handicapped by having our opinions rounded out for us. We were not trained in forming our own opinions. The curriculum for the last two years should be so designed and members of the faculty so selected that the student is inspired in the classroom to seek knowledge at its sources, then is given time to do this under such instructional guidance that his time will not be wasted. In other words the methods followed while I was at college needed changing to the end that the student might learn better how to work and think of his own volition, two very important things in after life, regardless of the many directions in which the Horticultural Student may go."

SUMMARY

1. A larger percentage of horticultural graduates in the past have entered the educational profession than any other field of work.

2. Botany and English courses have proved to be of the most value from the standpoint of general information and training.

3. Horticultural subjects and botany have been of the most specific value from the standpoint of every-day usage.

4. English, public speaking, and economics are the principal courses that horticultural graduates would elect more of if they were to go through college again.

5. Horticultural students should have more practical work. It would seem advisable that they be required to spend at least a summer's work in their major field before they receive a Bachelor's degree in horticulture.

6. In the past there possibly has been a deficiency in the quality and quantity of nursery practice courses. This has been remedied in part since many of the reporting members left the institution.

7. Comparatively few horticultural graduates return for graduate work.

8. The number of horticultural graduates who have entered the commercial field, it would seem, is sufficient to justify a broader marketing course.

ACKNOWLEDGEMENTS

The writer wishes to express his appreciation to Professors V.R.Gardner and F.C.Bradford, for their many valuable suggestions and criticisms during this survey, and also to Dr.J.Rufi for the privileges and inspiration received from him throughout the year.