

1958 Report from the Sub-Committee on the Encouragement of Research
Midwestern Association of Chemistry Teachers in Liberal Arts Colleges

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Over the past five years this sub-committee has sent out annual questionnaires to the members of MACTLAC having for their purpose the development of information on the amount of money available for research, the extent of research, the extent of publication, and possible blocks to research at the MACTLAC colleges. Last year the committee presented a five-year summary report covering the general situation.

This year we decided to eliminate the questionnaire and take advantage of the new report which has come from the National Research Council, entitled Doctorate Production in United States Universities, 1936-1956 with Baccalaureate Origins of Doctorates in Sciences, Arts and Humanities, Publication 582, compiled by the Office of Scientific Personnel. This publication lists over a 21-year period the number of Ph.D.'s having their baccalaureate origins in various undergraduate schools in some thirty disciplines together with summations for physical sciences, natural sciences, social sciences, arts and humanities, and finally education. The total number of institutions responding to the questionnaire of the Office of Scientific Personnel number 1177. The number of what might be called private liberal arts colleges in that group I estimate to be around 650 based upon a personal count and an evaluation of the individual colleges. Hence there is bound to be some confusion with regard to the borderline schools, but I think it can be said that in no case has a real liberal arts college been included in any other classification than this. For those of you who have not had occasion to see this report, I have included in Table I a listing of all the MACTLAC colleges in the last MACTLAC list. The table includes the number of Ph.D.'s in chemistry and

biochemistry, the number of Ph.D.'s in physical sciences, the number of Ph.D.'s in natural sciences, the number of Ph.D.'s in humanities, arts and social sciences, and the total number of Ph.D.'s.

The total number of Ph.D.'s in chemistry and biochemistry comes to 16,682. The total number of Ph.D.'s in these fields on the part of the MACTLAC colleges comes to 1353 or 9.2% of the total. There are 91 MACTLAC colleges; these make up 15% of the total number of colleges and 7.7% of the total number of institutions. Although MACTLAC colleges make up only 15% of the colleges, they have produced 32% of the college chemistry Ph.D.'s or twice the expectation based on the number of institutions. MACTLAC colleges have produced on the average of 15 Ph.D.'s per college in 21 years. The number per institution for all institutions is 14.3.* MACTLAC colleges, therefore, have produced better than the average for all colleges and universities. As a matter of interest, all colleges have been responsible for 25% of all chemistry Ph.D.'s; while the rest are largely university derived, there are also quite a number from technical schools and teachers colleges.

When we review the figures in natural science we find that MACTLAC colleges have averaged 29.2 Ph.D.'s in natural sciences for the period, while all institutions have averaged 40.8. When we consider all Ph.D.'s, the MACTLAC institutions have produced 64.4 per institution, all institutions 82.6. From these three sets of figures we might deduce that MACTLAC colleges are producing chemistry Ph.D.'s at a rate which is in excess of the rate in natural sciences and in all Ph.D.'s. Our chemistry departments apparently are more active than all departments or all those in the natural science category. While we produce more than the average in chemistry we produce only 74% of the average in natural sciences and 78% in all Ph.D. categories.

*If we leave out of consideration the MACTLAC women's colleges, then the average chemistry Ph.D. production per college rises to the figure of 17.4.

I have gone over all the college figures in Publication 582 and have listed those colleges which have produced 15 or more over the 21-year period. These are listed in Table II in alphabetical order together with the number of Ph.D.'s. Of these colleges, 28 of the 76, or 37%, are MACTLAC colleges. Remember that MACTLAC colleges make up only 15% of all of the colleges. More MACTLAC colleges are therefore more productive than would be predicted from their numbers.

Next have been listed as the most productive those colleges which are responsible for 30 or more Ph.D.'s in the period. These will be seen in Table III together with the number of Ph.D.'s. These 29 colleges are quantitatively the most productive in the country. Such a measurement of productivity does an injustice to the very small schools.

In order to get some kind of a qualitative index of productivity for the colleges producing 15 or more (Table II), I have carried through still another set of calculations. These involve the determination of the product of the total number of chemistry Ph.D.'s in the 21 years divided by the number of men who graduated from the particular school in the year 1957. (See Earned Degrees Conferred by Higher Educational Institutions, 1956-57, Circular 527 of the Office of Education.) To give significance to the figure, I should have obtained the actual number of men graduating from the school in the full 21-year period but this was impossible to do in a short time. As I check to see whether the 1957 figure was out of line, I also got the figure for 1952, as listed in Circular 360 of the same agency. As an illustration of the method for obtaining this relative number, and I should stress that this figure does not represent a per cent or anything else, let us consider Monmouth College. Monmouth College is given credit for 47 Ph.D.'s in chemistry

and biochemistry in Publication 582. In 1957 there were 83 men listed graduating. Forty-seven over 83 equals 56.6. This is the number which I have used in placing Monmouth College. This scheme is not quantitative, of course, but it does represent one means of giving credit where credit is due to the small colleges. I have then arranged in order all those colleges which have produced 15 Ph.D.'s or more and have relative productivity numbers of 15 or more arranged in descending order. This arrangement will be found in Table IV which also includes MACTLAC colleges producing less than 15 Ph.D.'s but with a productivity number over 15.* The first column following the name of the school represents the Numerical Rating developed as I have described. Then comes a figure representing the number of men graduating from the institution in 1957; the last column represents the number graduating in 1952. If the figures on these last two columns are relatively close together, I think it may be assumed that my Number Rating may not be too far out of line.

There are 77 colleges listed in Table IV; of these 77 colleges there are 38 MACTLAC colleges or 49% of the total number. This really shows the quality of MACTLAC chemistry. In all probability the relative standing of Park, Sterling and Illinois colleges are colored somewhat by variability and the very small numbers of men graduating. For with very small classes a difference of 21, as in the case of Park College, between 1957 and 1952 means a great difference in numerical rating. Nevertheless, I have left them in their order for they do show that all three colleges have done outstandingly good work in spite of very small registrations.

For those of you who are interested in comparing the quantitative production of your chemistry departments with your physics (and astronomy), and mathematics departments Table V and VI list the most productive colleges in these two fields. I have taken as a break point in the case of physics the figure of 5 and in the

* Since preparing this test, I have calculated all colleges having a productivity number of 15 or more so Table IV is now fairly significant on a country wide basis

case of mathematics a figure of 3 for the productive colleges, and for the most productive colleges break points of 10 and 5 respectively. These are based upon the relative numbers of Ph.D.'s in chemistry and biochemistry, physics and astronomy, and mathematics. If we look at the most productive colleges in each one of these three categories we will see that in chemistry 48% of the colleges are MACTLAC colleges, in physics 32%, and in mathematics 29.4%. In going over the physics list you will note that Park College has 9 Ph.D.'s in physics. In view of the limited enrollment at Park College I would rather guess that qualitatively this has been one of the most productive colleges in physics in the country over the last 21 years. Earlier studies have also rated it high.

I have left Mount Holyoke out of all these calculations and discussions. This all women's college has done a fantastic job of training women Ph.D.'s in chemistry. Its numerical rating is 12.5, or it has done about as well in turning out women Ph.D.'s as Williams College has in turning out men Ph.D.'s and exceeds in rating Dartmouth College which stands so high on the numerical lists. At the Wesleyan Conference this summer we had the pleasure of visiting Mount Holyoke College and saw its beautiful new chemistry building. Any of you who are interested in building chemistry buildings and are in the east by all means should visit this institution.

Let me close by saying that next year we will attempt a biannual report on research grants and research activities. I think we have reached the point in MACTLAC where there is not enough change from year to year to warrant continuing annual studies.