A one semester course may fit very well into a teacher training program where time is limited, but it might be of advantage to follow that up with a second course in mammalian anatomy, it was pointed out, however, that the liberal arts colleges provide more teachers for the secondary schools than do the teacher's colleges, and that in some cases five years are needed for the completion of the preparation with a major in a field of study other than education.

There was also discussion concerning the relative merits of purely technical vs. liberal arts training, and of training for medical schools, or for well trained zoologists who could pursue work in graduate school or in medical research.

Because so many students are undecided about their future plans, it seems best to give them solid training in fundamentals and to trust them to make applications of them when their needs arise. With that in view, the group made the recommendation that this combined course be treated as basic training for the development of zoologists rather than direct it toward any specific technical field.

CONFERENCE OF MIDWEST BIOLOGY TEACHERS
October 25-26, 1957
Drake University, Des Moines, Iowa

Discussion Group #1

A. What constitutes a biological core curriculum? Should it be the same for pre-meds as for other majors?
B. Integration courses for seniors.

Chairman — Ralph P. Frazier, Monmouth College, Monmouth, Illinois.

Recorder — Brother L. George, St. Mary's College, Winona, Minnesota.

Participants (33)
Sister Teresita
Sister M. Ursula
Sister Mary Thomasine
Rev. N. E. Nye
Alice Carlson
Clive Thomas
John M. Hamilton
J. W. Hudson
Ralph P. Frazier
R. Maurice Meyers
Dr. Theodore Urban
L. P. Conen
Brother L. George
J. Fred Moyer
Arlan L. Edgar
Wendell V. Showalter
Clarence Hams
Fred A. Fleming
G. T. Walter
Farris H. Woods
L. F. Jansen, S. J. (Rev.)
Ronald P. Smith
John R. Cortelyou (Rev.)
Mary A. McWhinnie
Daniel F. Burton
Karl H. D. Beesele

The College of St. Catherine
Mount Mary College
Mount Mary College
Loras College
Central College
William Jewell College
Parks College
Loyola
Monmouth
Western Ill. University
Creighton University
University of Detroit
St. Mary's College
College of St. Thomas
Alma College
Hastings College
Tabor College
McKendree College
Macalester College
Central College
Creighton University
Buena Vista College
De Paul University
De Paul University
Mankato State College
University of Omaha
St. Paul, Minnesota
Milwaukee 10, Wisconsin
Milwaukee 10, Wisconsin
Dubuque, Iowa
Pella, Iowa
Liberty, Missouri
Parkville, Missouri
Chicago 26, Illinois
Monmouth, Illinois
Macomb, Illinois
Omaha, Nebraska
Detroit, Michigan
Winona, Minnesota
St. Paul, Minnesota
Alma, Michigan
Hastings, Nebraska
Hillsboro, Kansas
Lebanon, Illinois
St. Paul 5, Minnesota
Fayette, Missouri
Omaha, Nebraska
Storm Lake, Iowa
Chicago, Illinois
Chicago, Illinois
Mankato, Minnesota
Omaha, Nebraska
The chairman pointed out that there were two topics to be discussed by the group—core curriculum and senior integration. In that there was to be a report the following morning by Willis Johnson on the "Conference on Undergraduate Curricula in Biology" sponsored by the National Academy of Sciences, it was suggested that this topic might be left to the second meeting which would follow Dr. Johnson's presentation. However, it was the consensus of the group that it would be better to discuss this topic of core curriculum first. They would not be prejudiced in any way by the conclusions of this report. The chairman asked that some schools give their requirements for majors in Biology. Fr. Nye (Loras College) said that of the 30 sem. hours required of all majors the following courses were required: General Biology - 8, Comparative Anatomy-4, and Comparative Embryology-4. Meyers (Western Illinois) said that 32 semester hours were required. The following courses were required: Biology, Field Biology, Genetics, 2 upper division courses in both Botany and Zoology. Likewise a year of the following allied sciences were required: Geology, Physics, and Chemistry.

At this point it was asked whether we were to consider just the biology curriculum or should the required courses in the allied sciences and mathematics be included. The group voted to limit the discussion to the biology courses.

The chairman asked for a show of hands concerning the number of semester hours of biology required. The range was from 24 to 36 with a somewhat normal distribution curve.

It was asked of Fr. Nye the reason for requiring Comparative Anatomy and Embryology of all biology majors. It was answered that 90% of the biology majors are preprofessional students.

It was asked how many schools have some Botany, that is 3 or 4 courses. A good share of the group raised their hands.

Urban(?) (Creighton) said that Botany was neglected. This shows up in the teaching of biology in the high school.

Fr. Cortelyou (DePaul) asked of any schools had a system of counseling in which future teachers were told how much Botany and how much Zoology they should take. Burton (Mankato) and Meyers (Western Illinois) mentioned briefly how they advised each student concerning his program of studies.

Sister Teresita (St. Catherine) asked why so many biology courses were required in view of the courses the student must take in other fields. It was answered that the total range was within the 24-36 semester hours limits.

Shawhan (Drake) said that they require: Freshman Biology (year), and semester courses in Invertebrates, Anatomy, Physiology, Embryology, and Senior seminar.

Burton (Mankato) noted that teachers colleges require many education courses which automatically limit the number of courses in biology. It is in such schools that the lower range of required semester hours are found.
It was asked what outlets there were for Botanists in terms of job opportunities. Burton (Mankato) noted among others those of graduate school, agriculture, and pharmaceutical companies.

Meyers (Western Ill.) mentioned the problem of human ecology. We are dealing with clift-dwelling urban people who just don't like plants.

Some discussion followed concerning the handling of pre-medical students. Besides majoring in biology it was noted that in several institutions that they either majored in chemistry or a science divisional major.

Walter (Malcalaster) spoke in favor of a functional major which would vary according to the future demands of the student. There would thus be different requirements for such groups: teachers, doctors, technicians.

A short intermission followed.
The chairman asked Anderson (Bethel) to start the discussion following the ten-minute break. He thought it might be well to consider the whole problem of the core curriculum from the viewpoint of the outcome desired in contrast to the courses to be required. In short it would be a matter of stating the objectives of the biology department and seeing how they could be accomplished.

Hudson (Loyola) said that training for the graduate record examination during the senior year could be taken as a general goal.

Brother George (St. Mary's) suggested that the covering of the six core principles of morphology, physiology, genetics, embryology, ecology, and systematics should be the goal of the department.

Several members of the group brought up the fact that the development of attitudes is very much neglected. It was likewise noted that some thought should be given to the development of the scientific method.

Concerning the use of scientific literature Frazier (Monmouth) mentioned how they take care of this in the senior departmental seminar and through activities of the B. B. B. honor society.

In view of the time the chairman suggested that some minutes be given to the consideration of the second general topic- Senior Integration Course. Frazier (Monmouth) sketched the outline of their setup. It covers the complete senior year carrying 6 hours of sem. Credits. The group meets for 2 hours on Friday afternoons. The purposes are to develop the scientific method and to tie together biological concepts. The syllabus runs as follows:
1. Discussion of the scientific method.
2. Use of the library- considerable time is given to this. A library research paper is required of each student as a fruit of this work.
3. Research techniques are discussed throughout the rest of the first semester. Each student is required to work out one problem. At the present time many of them are concerned with electrophoresis work on snake venom and Dermatophytes. The student figures out his own problem. Many of them carry on from the point where a former student left off.
4. History of biology- during the greater part of the second semester.
5. Relation of science to other fields.

Hamilton (Park) said that their integration course consisted in some work in following Conant's case studies, followed by work on biological literature. Emphasis was given on the use of the biological abstracts. A paper is required. Original sources must be used.
Brother George (St. Mary's) said that the seniors are required to present short papers for discussion at the weekly seminar (source is recent biological journals); a thesis based on personal observation or experimentation; and a three-hour course on the history and philosophy of biology.

Shawban (Drake) mentioned that all prospective teachers are required to assist in the Freshman laboratory 4 hours each week.

Hudson (Loyola) pointed out the danger of reducing the research work being done to that of dishwashing.

Carlson (Central) said that a 40 minute talk on a library paper which cuts across at least two departments was required of seniors.

Walter (Macalaster) said that they give a reading course to prepare for the graduate record examination.

Meyers (Western Ill.) said that a Senior Tutorial by 8 members of the staff was conducted with 2 sen. hours of credit which did not count on fulfilling their major. In general it consisted in a list of questions given to the student on a given field.

A show of hands indicated that 10 of the 30 schools represented require a thesis or some type of research. About the same number require the graduate record examination.

McWhinnie (DePaul) said that they give a course on the Introduction to Research Instrumentation. The students are shown how to use various instruments and required to do a problem in each. She felt that the undergraduate student was not yet in a position to do what one would call real research. To have some familiarity with the techniques employed in research was considered more to the point.

At the close of the meeting someone asked whether there was such a person as a biologist today. One view expressed was that a negative answer must be given. Biology is a division of sciences and different requirements are necessitated depending upon the future wants of the individual involved.

**SUMMARY OF SATURDAY A.M. DISCUSSION**

Two items of business were conducted as determined by the general meeting held prior to this group meeting. A total of $27, was turned in to help defray expenses of the second annual meeting of the Conference. Dr. Frazier of Monmouth was elected as a member of the steering committee to make arrangements for the next year's conference.

The chairman listed the core curriculum as presented by Dr. Willis Johnson's Committee at the general meeting. It is as follows:

1. General Biology
2. Upper division (areas of content)
   Genetics; growth and development; cell biology; physiology; ecology.

Burton (Mankato) recommended that as wide a range of courses as possible be allowed. The important thing only is that the core areas be covered. Some of these areas could be covered in botany, some in zoology, and some in both.

Hamilton (Park) asked why evolution was not included in the core of upper division subjects. It was answered that this topic was one that was to be covered in the Freshmen Biology Course. Brother George (St. Mary's) noted that many schools