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ROLES, OBJECTIVES AND PROGRAMS
FOR THE BASIC SCIENCES (1965)

I. Definition of the Basic Medical Sciences

There are six major basic medical science departments at the University of Minnesota: Anatomy, Biochemistry, Microbiology, Pathology, Pharmacology, and Physiology. Three additional disciplines are sometimes added: Behavioral Science, Biostatistics, and Human Genetics. This report will be concerned primarily with the major six.

II. Role of the Basic Medical Sciences

Almost all of the activities of the six departments can be categorized under teaching or research. They have essentially no service functions.

A. Teaching

Outsiders, including members of the University Community outside the basic medical science departments, probably consider the primary function of these departments as teaching of medical students with the instruction of students of the other health professions falling in a secondary position. In reality, fully as much emphasis, and probably more time and effort, is placed in the training of the graduate students as in medical student teaching. Several of the departments also play a significant role in elementary biological instruction for students from the College of Liberal Arts and the Institute of Technology.

B. Research

Again probably contrary to most outsiders' views, the basic medical science departments do not limit their research to investigations on basic problems closely related to applied clinical research; that is, they are not concerned exclusively with basic medical research. A large, if not major, fraction of the research is involved with fundamental biological mechanisms which may be far removed from the normal or abnormal functions of the human patient. This does not mean that the research does not have ultimate implications for the human health, but it is of a nature that the outsider might expect it to be carried out in a college of biology rather than in a medical school. At the University of Minnesota, as at many other universities, a substantial fraction of all fundamental biological investigations are carried out in the Medical School.

III. Objectives of the Basic Medical Sciences

A. Teaching

One of the major philosophical problems facing the basic medical science departments is concerned with the relative emphasis to be placed on teaching graduate students and undergraduate (especially, medical) students. Although most faculty members consider their primary function to be medical student teaching, the major part of their time and effort probably goes in most instances into graduate instruction. In large part, this is

the consequence of the apprenticeship method of graduate teaching as opposed to the more economical lecture system in medicine. Further, despite their stated beliefs, many professors tacitly consider the training of future investigators and academicians to be more important than teaching the complexities of basic science to prospective physicians. A part of the problem also arises from the heavy emphasis on fundamental biological mechanisms in the professors' research. This is frequently so far removed from clinical medicine that the medical student has little interest; it is also so complex that his inadequate background in mathematics and physical science precludes ready understanding. The graduate student, with no more native ability, but with a superior scientific background and different motivation, is usually both interested and capable of understanding.

It might properly be pointed out that the problem would be eased if the emphasis on research were reduced. This is obviously an unrealistic solution. Professors (a) are interested in research and (b) know that their salary is more closely related to their research (and associated graduate training) activities than to undergraduate teaching.

It seems reasonable to conclude that the objective of the basic science departments will continue to be to provide a first-class education to both medical and graduate students; and that despite the fact that both are considered equally important, somewhat more time will go into graduate training because of the nature of the teaching techniques and also because of the greater interest of the student in the professor's scientific concerns.

Another teaching objective is to provide an appropriate amount of knowledge of basic medical science to students of dentistry, medical technology, nursing, pharmacy, physical therapy, dental technology, and other health fields. What is appropriate must be determined by a continuing close liaison between the basic science departments and the schools or divisions sponsoring the students. It may be appropriate to increase the quality and/or quantity of this effort in the future, especially if there is a continuing increase in the reliance on paramedical personnel in the treatment of patients.

Some learning in elementary principles of biology is important to students in CLA and IT. In some respects, the basic medical science departments are better equipped to fulfill this purpose than the undergraduate biology departments. For this reason, Microbiology and Physiology presently have a significant involvement in such courses. Whether this will increase or decrease in the future is difficult to predict, depending as it does on the development of the new College of Biological Sciences.

One of the major objectives in teaching is to maintain high quality instruction in the face of rising numbers of students; and, indeed to attempt to improve by trying new teaching techniques.

B. Research

The major research objective of the basic medical science departments is to provide a milieu in which individual professors can carry on research

in the fields of their primary interest. Such a milieu includes not only adequate physical facilities and equipment, but also stimulation from the presence of other well-trained and highly motivated investigators.

Although directed research is frowned upon, it is considered desirable to build departmental staffs such that all major aspects of a particular basic scientific discipline are always under investigation. This has important implications in the instruction of all students, medical, graduate and others, since it means that teaching is usually performed by a professor with much more than a textbook background in his topic. Such broadly knowledgeable departments in these days of proliferation of information must necessarily be large.

IV. Programs

Present

A. Teaching

1. Medical

150 students spend parts of 2 to 3 quarters in each of the 6 major departments for a total of 98 credits. In addition, they take 3-credit courses in behavioral science and biostatistics.

2. Graduate

The number of graduate students has increased from three-to-four -fold in the last 10 years. Approximately, one quarter of these have the M.D. degree. Most departments are close to their capacity for handling of graduate students, capacity being determined by a ratio of 4 to 6 students per professor which is generally thought to be maximal for high quality instruction. Although in broad outline, the graduate program is set down by the Graduate School, the particular courses, seminars and research activities participated in by the students is usually determined at the departmental level.

3. Other Health Fields

The six major departments provide 1 to 3 courses per year for 100 dental students. Most of the departments participate in teaching of students of nursing (about 120 per year), medical technology (60) and pharmacy (60). In addition, some 25 physical therapists and 40 dental hygienists receive instruction in two or three of the departments.

4. College of Liberal Arts, Institute of Technology, Institute of Agriculture

Two departments have a major involvement with these students. Microbiology offers a 5-credit course twice a year which is attended by 350 to 400 students from CLA and IA. Physiology has a 2-quarter, 6 or 10 credit sequence for some 120 IT students and another 5-credit course taken by 100 to 150 students of CLA and IA.

B. Research

Research programs are determined almost exclusively by the individual professor. They vary from paper and pencil studies of mathematical models to experiments on basic molecular mechanisms in completely artificial systems to observations on the function of normal human subjects. Some indication of the magnitude of the overall program is shown by the total budget for research in the six major departments of approximately \$_____.

The relation between faculty research and graduate teaching programs is so close that they cannot be separated. A large part of the training of a graduate student comes from his participation in the research program of his faculty advisor. The intimate relationship is no better shown than by the fact that if external grants were removed, graduate training would nearly cease to exist.

Another educational feature of the research programs is the post-doctoral, non-degree training of fellows.

Future

A. Teaching

There will obviously be quantitative changes. Medical student class size will likely increase to 200, and similar if not disproportionate increases can be anticipated in the classes for others in the health science fields. The increase in number of graduate students is likely to be closely related to changes in size of the staff; the ratio of 4 to 6 students per professor will be maintained. Future programs for undergraduates in CLA and IT depend on the development of the College of Biological Sciences.

With respect to qualitative changes, there should be continuing review of the curriculum and experimentation with new techniques. Curriculum changes might take the form of combining 2 or more basic science courses into a single integrated course, more effective correlation with clinical topics, some redistribution of credit hours, or inauguration of completely new courses. Changes in methodology might include adoption of programmed learning in some form, increased use of teaching aids like films and video tape, greater reliance on laboratory demonstrations as opposed to student experiments, etc. Any such alterations should presuppose the development of adequate means of measuring the consequences.

B. Research

Future programs in research will be determined by individual investigators. It does seem likely that the trend will continue toward more fundamental investigations and away from those aspects closely related to applications.

The Basic Science Subcommittee has reexamined its earlier recommendations for increases in faculty and space by 1973 in light of the editing committee's report and has come to the following conclusions.

Faculty Positions. The subcommittee recommended 27 new full-time and 9 part-time positions. The editing committee apparently reduced this to 25 full-time positions; it is not clear to us what has happened to the 9 part-time ones. If it is the intention of the editing committee to remove the part-time positions also, the reduction is 6, not 2, full-time equivalent positions. This, the subcommittee thinks, would be most unwise. It will very likely reduce the present quality of teaching and certainly will obviate any significant upgrading in basic science instruction as requested by the School of Dentistry and as is likely to be asked by the Medical School Educational Policy Committee.

Space. The subcommittee recommended 103,000 ft², 41,000 to satisfy immediate pressing needs and 62,000 to accommodate the envisioned increase in students and faculty. The editing committee reduced this by 40% to 63,000. As our earlier report emphasized, it is our considered opinion, developed in consultation with the basic science departments, that the 103,000 ft² is the MINIMUM compatible with maintenance of high quality teaching and research. We have seen no new evidence to indicate that our opinion was in error. We are, therefore, forced to conclude that the 40% reduction, if it stands, can only result in a significant deterioration in the present status of the basic science departments.

Several points can be made to emphasize the inadequacy of the editing committee's suggestion.

(1) Their proposal of 2,400 ft² per new faculty position agrees closely with the USPHS guide of 2,380 which can be easily shown to be a gross underestimate of the needs of basic science departments in a College of Medical Sciences. The USPHS guide was developed for departments involved in teaching medical students only. It envisions no instruction of dental, medical technology, nursing, etc. students. It envisions essentially no graduate program, anticipating a ratio of less than one such student per staff member (compared to the ratio of 4:1 here). It allows for a minimal research program only; for example, it allots only 3 research labs of 600 ft² each for 8 faculty members of a hypothetical physiology department; even if all space (seminar rooms, storage room, graduate student labs, offices) were converted to faculty research, there would be less than 1,000 ft² per staff position. Clearly the USPHS guide is for a trade school, not a university department. The agreement of the editing committee's proposal with the USPHS, ~~this~~ guide is excellent evidence of the inadequacy of the ~~W~~ proposal.

(2) The subcommittee recommended approximately 27,000 ft² for direct teaching purposes and 5,000 ft² for departmental offices. If the editing committee's suggestion stands, this would leave only 31,000 ft² or 1,200 per faculty member for office, research labs, departmental equipment and storage rooms, and all graduate teaching activities. First class faculty can be neither recruited nor retained under such circumstances.

(3) The overall increase in space for the Health Sciences is 745,000 ft² or 58.6% over the present space. The increase suggested by the editing committee for the basic sciences is only 39%. If the basic sciences shared in the general increase, they would receive 94,000 ft², which is not too far from our requested 103,000. The importance of the basic sciences as a foundation for the other parts of the health science enterprise needs to be emphasized, not de-emphasized.

The subcommittee strongly urges that its original recommendation be accepted. If the editing committee decides that this cannot be done, the subcommittee requests that the final report of the Physical Facilities Committee state explicitly that the space allotted to basic sciences was judged by the Basic Sciences Subcommittee to be inadequate to permit the maintenance of first class teaching and research.

COMMITTEE FOR THE STUDY OF PHYSICAL FACILITIES
FOR THE HEALTH SCIENCES

Basic Sciences Sub-Committee

Minutes of Meeting May 20, 1965

Present: Eugene Grim, Chairman, Cyrus Barnum, Ellis Benson, Robert Isaacson, Joseph Larner, Lee Wattenberg, John Westerman

Absent: Richard Bond, K. Gerhard Brand, Isabel Harris

NEXT MEETING: AT CHAIRMAN GRIM'S CALL

Chairman Grim reported that at the May 10th Learn Committee meeting it was suggested that the Basic Sciences group consider in their study the relationship to Genetics and Behavioral Sciences. Dr. Wattenberg will gather some information about the future plans for Behavioral sciences and Dr. Barnum will contact a representative of the Genetic's group of similar information.

The sub-committee reviewed a three page questionnaire that Dr. Grim is using in his personal interviews of department chairmen. Dr. Grim has interviewed four basic science chairmen to date. When he has completed the other two interviews, Dr. Grim will write a summary report. Following are some impressions from his first four interviews.

1. All of the chairmen agreed that there will likely be an increase in the number of medical students. There was some question as to the desirability of this trend. There was some feeling that the basic sciences could accommodate the increase easier than the clinical sciences.

2. There were different opinions about the creation of a second medical school. Some thought the University was as large as it should get. An increase in students would come at the expense of other values. There seemed to be

agreement that the creation of a second medical school would pose problems of duplication, and competition for appropriations.

There was an idea that a modified second school or affiliation plan might be the solution. Under this arrangement the basic sciences would be housed at the University while the clinical sciences would be split between the university and other local facilities.

3. The interviews produced no definitive views about a curriculum change. There was a suggestion that some kind of a split plan of education which would recognize the differences in research and clinical preparation should be considered. The trend toward early introduction to clinical medicine and returning to basic sciences in the third or fourth year was not looked on with any degree of enthusiasm.

It did appear that a curriculum review would become an ongoing policy under the educational policy committee provided for in the medical school constitution. In summary, the interviewees did not foresee any curriculum change that would dramatically change the staff size or physical layout.

4. The group thought some improvements could be made in space utilization by greater emphasis on sharing facilities. There was some discussion of the value of student cubicles where the student has a base of operations. No conclusions were reached, but it was pointed out that the development of the cubicles might help allay the suspicions of medical students that the needs of graduate students are being met while theirs are neglected.

The sub-committee thought it would be helpful to get the view of the people in clinical medicine about the educational objectives in basic science. Dr. Grim will contact Dr. French this summer about the possibility of a joint meeting.

5. A 3-4 fold increase in the number of graduate students over the last 10 years seemed likely to continue in the next 10 years, although at a slower rate. There seems to be an adequate supply of graduate student applicants and the demand for their services continues at a high level. The source of students should be from the undergraduate programs in physical sciences. Pharmacology is getting more students from chemistry than from the school of Pharmacy, for example.

6. The group thought there would be an increase in the number of post M. D. graduate students. The group thought it was important for the clinical investigator to take advanced work in a basic science, even if the student is not planning on completing the work for a Ph. D. A Ph. D. in a clinical science, however, was not thought to be of much merit.

7. A normal ratio for faculty-graduate students might be 1-3 or 4. The maximum ratio would be 1 - 5 or 6. A larger department needs less faculty to the extent that graduate students lighten the advising load. Presumably, a post doctoral fellow would also do some advising. There was some talk in the sub-committee about the implications of these ratios in relationship to square footage per faculty, fellow, and student for laboratory and office.

8. The group thought that graduate students were not receiving an undue proportion of teaching time in relationship to the time spent with medical students. The group is aware of the concern of the clinical faculty that the medical student is being left to the basic science junior faculty.

9. Less than 1/3 of the overall basic science support comes from the University. The sub-committee discussed the idea that the source of funds should not

have a bearing on teaching, research, and service responsibilities. Another trend noted was the addition of basic science faculty in recent years who have not had their training within a medical school.

Respectfully submitted,

John H. Westerman
Executive Secretary

COMMITTEE FOR THE STUDY OF PHYSICAL FACILITIES
FOR THE HEALTH SCIENCES

Basic Sciences Sub-Committee

Minutes of Meeting July 22, 1965

Present: Eugene Grim, Chairman, Cyrus Barnum, Ellis Benson, K. Gerhard Brand, Isabel Harris, Joseph Larner

Absent: Richard Bond, Robert Isaacson, Lee Wattenberg

NEXT MEETING: Tuesday, September 7 at 3:30 p.m. in 424 Millard.

Dr. Grim distributed a preliminary summary of responses to a questionnaire discussed with department chairmen in the Basic Sciences and a draft of a report of the Basic Sciences sub-committee to the Learn committee. Regarding the statement draft Dr. Grim reviewed the Parent Committee request for a report of role, objectives, programs of the Basic Science Departments. It was agreed the sub-committee would meet once more to review and finalize the statement before presenting it to the parent committee.

The question of the Department of Genetics coming into the College of Basic Sciences arose Dr. Brand explained that the Department of Microbiology gave a short course in Genetics to medical students but it was not population genetics. There is presently no course in Medical Genetics except as part of other courses. Genetics was assigned to Microbiology when it was dropped as a required course in the medical student curriculum. However population genetics does not fit into Microbiology. To include a Genetics course in the medical students curriculum would mean overloading an already heavy schedule or the deletion of some other course.

It seemed apparent to the committee that if the proposed Medical School Constitution Revision is accepted curriculum changes will be more likely to occur.

It was noted that Dr. Hathaway, Behavioral Sciences, foresees no additional space or staff needs or course changes in the future planning.

There was question as to whether entire faculties should be interviewed or only Department Heads as to future planning. It was suggested that individual faculty members might be biased in their specific field without an overall picture of an entire department where a Department Head would be more likely to know the attitudes of his faculty with a better view of the department.

In estimating the needs for the future it was agreed that curriculum changes had to be considered. Some private medical schools have made some radical course changes, such as Western Reserve, Harvard, Duke. For example: the first year covers the Basic Sciences, second year - clinic; third year - electives; fourth year - internship (a teaching year). An anatomy course taught as a third year elective by surgeons.

Dr. Benson suggested thought should be given to curriculum changes on the high school level where advanced science courses could be completed as a prerequisite to college or pre-med courses: The courses do not have to be disease oriented to be important to the medical student and if well taught Basic Sciences could be covered in undergraduate courses.

Many Basic Sciences do not belong in medical school courses and could be taught as applied sciences or prior to medical school. Also with revision of courses more students could be taught more efficiently, e.g. Washington and Stanford have one freshman lab and one sophomore lab with 75-120 students.

Most undergraduate students in the Basic Sciences go on to graduate or medical school. Average number of graduate students per professor is 4 to 6. If the number is to grow the staff would have to increase to adequately meet the needs of the students.

The committee felt this opportunity to study and estimate its future needs was a chance to review the most radical changes as possibilities for improvement of courses and teaching and the more progressive their thought the more likely such considerations would actually meet the demands of the future. In the final report they might show a range of conservative to radical changes.

In projecting future needs the student/professor ratio will probably be the constant figure, therefore each area should be examined as to its future development or decrease in activity to maintain equal distribution of emphasis toward varying types of students. Growth must be coupled with staff expansion.

The committee was requested by Dr. Grim to review the statement draft and make suggestions as to additions, deletions, etc. with thought to possible questions which would be sent to the Basic Science faculty and any ideas to be incorporated in the final report to the parent committee as to radical curriculum changes.

COMMITTEE FOR THE STUDY OF PHYSICAL FACILITIES
FOR THE HEALTH SCIENCES
Basic Sciences Sub-Committee

Minutes of Meeting September 7, 1965 (#4)

Present: Eugene Grim, Chairman, Ellis Benson, Nancy Cook (for Isabel Harris), Robert Isaacson, Joseph Larner, Lee Wattenberg, John Westerman

Absent: Richard Bond, K. Gerhard Brand

NEXT MEETING: At the call of the Chairman.

Chairman Grim had circulated a draft statement of roles, objectives and programs prior to the meeting. Dr. Grim asked for comments from the group.

Dr. Isaacson, speaking for the school of dentistry, noted that the teaching objective section about dentistry is not strong enough. The report should reflect the objectives of the dental sub-committee report where specific reference was made to upgrading the amount and quality of basic science training for dental students. In order for the Dental School to achieve its objective, it will need the support of the basic science committee. It would be helpful if dentistry could be deleted from the group of other health science professions on page three of the report and come under a separate statement. This request is independent from the consideration of taking basic science courses with the medical students. Perhaps a distinction could be made between applied health science and research health science.

After some discussion the committee decided to add a separate statement about dental students on page three. The committee did not think it was within the scope of their duties to make a statement about the need for upgrading training in the basic sciences for dental students. The committee did decide to add a statement about the changing role of dental education at Minnesota and the relationship of this change to the basic sciences.

The committee then discussed the relationship of the basic sciences to the College of Biological Sciences. After some discussion, the group decided to make a statement in the report which would assume that the College of Biological Sciences would not duplicate the medical science departments. It was suggested that the basic science departments should give serious consideration to the staffing problems involved in undertaking the total role for undergraduate teaching.

COMMENT: In talking about department roles, there used to be a debate in medical schools over the merit of MD-PHD basic science department chairman versus PHD only basic science department chairman. One fear of having a PHD chairman was that the departments would emphasize graduate student education and move so far away from a course geared for the practitioner that the medical student couldn't understand it. To some extent, this fear has been justified. I wonder if we aren't going to move back to the MD-PHD concept for department chairman? At any rate, there does seem to be a movement to give more emphasis to a program with medical student

orientation. This means that you could reduce the course content. There is such a tremendous range of knowledge today (in the basic science courses) that you must emphasize the middle ground. The task is to sort out this knowledge and decide what not to teach as well as what to include. For example, the Bio-chemistry Department now has two basic courses. Even with this development, the educational philosophy is to teach either a large amount of material or an understanding of principles that underlie the material.

COMMENT: Coming back to the point about MD-PHD chairman, I believe if you restrict your choice to MD-PHD's, then you restrict the potential pool for department chairmanships, and also may limit the strength of the department.

COMMENT: Perhaps the point is that smaller departments are more efficient and the issue is one of determining at what point does the size of a department have more disadvantages than advantages.

COMMENT: It should also be noted that there is a great difference among the medical students. Many are capable of absorbing advanced material but the general practitioners do not need this depth of knowledge. You should remember you are dealing with an average.

COMMENT: I would agree with the points about knowledge explosion and the importance of emphasizing principles that can be applied. However, with the medical student you must do more and work out the threads of knowledge that run through the course.

It was noted that physiology plans to separate the transport portion of

its course for medical students from that for graduate students because of inadequate background of the medical students. Qualified medical students may take this section of the course with graduate students.

COMMENT: Many, if not all of the basic science courses, before too long, will have separate courses designed for the needs of the medical student and for the graduate student.

The committee discussed the remainder of the report and made several minor corrections that will be reflected in the report given to the Learn Committee on Monday, September 13. Mr. Westerman announced that Dr. Learn would like to invite all of the committee members to the September 13th meeting to hear Dr. Grim present the report.

Respectfully submitted,

John H. Westerman
Executive Secretary

September 10, 1965

**TO: Members of the Committee for the Study of Physical Facilities
for the Health Sciences**

The attached material is a preliminary report of the Basic Sciences Subcommittee prepared in the format suggested by Dr. Learn's memorandum of June, 1965.

The members of the Subcommittee are:

Ellis Benson, Professor, Laboratory Medicine

Richard Bond, Professor, School of Public Health

Gerhard Brand, Associate Professor, Microbiology

Isabel Harris, Assistant Director, School of Nursing

Robert Isaacson, Associate Professor, School of Dentistry

Joseph Larner, Professor, Biochemistry

Lee Wattenberg, Associate Professor, Pathology

**John Westerman, Executive Secretary, Committee for the Study
of Physical Facilities for the Health Sciences.**

**Eugene Grim, Chairman
Basic Sciences Subcommittee**

There are six major basic medical science departments at the University of Minnesota: Anatomy, Biochemistry, Microbiology, Pathology, Pharmacology, and Physiology. Three additional disciplines are sometimes added: Behavioral Science, Biostatistics, and Human Genetics. This report will be concerned primarily with the major six.

I. Role of the Basic Medical Sciences

Almost all of the activities of the six departments can be categorized under teaching or research. With the exception of Pathology, they have essentially no service functions.

A. Teaching

Outsiders, including members of the University Community outside the basic medical science departments, probably consider the primary function of these departments as teaching of medical students with the instruction of all other students falling in to a decidedly secondary position. In reality, fully as much emphasis, and probably more time and effort, is placed in the training of graduate students as in medical student teaching. In addition, large blocks of time are devoted to instruction of students of dentistry, medical technology, nursing, pharmacy, physical therapy and dental hygiene. Several of the departments also play a significant role in elementary biological instruction for students from the College of Liberal Arts and the Institute of Technology.

B. Research

Again probably contrary to most outsiders' views, the basic medical science departments do not limit their research to investigations on basic problems closely related to applied clinical research; that is, they are not concerned exclusively with basic medical research. A large, if not major, fraction of the research is involved with fundamental biological mechanisms which may be far removed from the normal or abnormal functions of the human patient. This does not mean that the research does not have ultimate

implications for human health, but it is of a nature that the outsider might expect it to be carried out in a college of biology rather than in a medical school. At the University of Minnesota, as at many other universities, a substantial fraction of all fundamental biological investigations are carried out in the Medical School.

II. Objectives of the Basic Medical Sciences

A. Teaching

One of the major philosophical problems facing the basic medical science departments is concerned with the relative emphasis to be placed on the teaching of graduate, medical, dental and undergraduate students. Since the departments are in the Medical School, most faculty members consider their primary function to be medical student teaching despite the fact that a greater part of their time and effort goes in most instances into graduate instruction. In large part the greater emphasis on graduate teaching is the consequence of the use of the apprenticeship method as opposed to the more economical lecture system in medicine; however, despite their stated beliefs, many professors tacitly consider the training of future investigators and academicians to be more important than teaching the complexities of basic science to prospective physicians. In addition, graduate training is more consonant with the fundamental nature of many of the professors' research projects. These are sometimes so far removed from clinical medicine that the medical student may have little interest or understanding. It seems reasonable to conclude that one of the objectives of the basic science departments will continue to be to provide a first-class education to both medical and graduate students although changes in relative emphasis may occur.

Another teaching objective is to provide an appropriate amount of knowledge of basic medical science to students of dentistry and the other health fields. What is appropriate must be determined by a continuing close liaison between the basic science departments and the schools or divisions

sponsoring the students. It may be appropriate to increase the quality and/or quantity of this effort in the future, especially if there is a continuing increase in the reliance on paramedical personnel in the treatment of patients. This is particularly true in the case of dentistry where the anticipated future role of the graduate dentist will require an increased basic science background.

Some learning in elementary principles of biology is important to students in CLA and IT. In some respects, the basic medical science departments are better equipped to fulfill this purpose at the present than the undergraduate biology departments. For this reason, Microbiology and Physiology presently have a significant involvement in such courses. Whether this will increase or decrease in the future is difficult to predict, depending as it does on the development of the new College of Biological Sciences.

One of the major objectives in teaching is to maintain high quality instruction in the ~~face~~ of rising numbers of students; and, indeed to attempt to improve by trying new teaching techniques.

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The major research objective of the basic medical science departments is to provide a milieu in which individual professors can carry on research in the fields of their primary interest. Such a milieu includes not only adequate physical facilities and equipment, but also stimulation from the presence of other well-trained and highly motivated investigators.

Although directed research is frowned upon, it is considered desirable to build departmental staffs such that all major aspects of a particular basic scientific discipline are always under investigation. This has important implications in the instruction of all students, medical, graduate and others, since it means that teaching is usually performed by a professor with much more than a textbook background in his topic. Such broadly knowledgeable departments in these days of proliferation of information must necessarily be large.

III. Programs in the Basic Medical Sciences

Present

A. Teaching

1. Medical

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The number of graduate students has increased from three- to four-fold in the last 10 years. Approximately, one quarter of these have the M. D. degree. Most departments are close to their capacity for handling of graduate students, capacity being determined by a ratio of 4 to 6 students per professor which is generally thought to be maximal for high quality instruction. Although in broad outline, the graduate program is set down by the Graduate School, the particular courses, seminars and research activities participated in by the students is usually determined at the departmental level.

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4. College of Liberal Arts, Institute of Technology, Institute of Agriculture

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which is attended by 350 to 400 students from CLA and IA. Physiology has a 2-quarter, 6 or 10 credit sequence for some 120 IT students and another 5-credit course taken by 100 to 150 students of CLA and IA.

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Research programs are determined almost exclusively by the individual professor. They vary from paper and pencil studies of mathematical models to experiments on basic molecular mechanisms in completely artificial systems to observations on the function of normal human subjects. Some indication of the magnitude of the overall program is shown by the total budget for research in the six major departments of more than \$2, 500, 000.00.

The relation between faculty research and graduate teaching programs is so close that they cannot be separated. A large part of the training of a graduate student comes from his participation in the research program of his faculty advisor. The intimate relationship is no better shown than by the fact that if external grants were removed, graduate training would nearly cease to exist.

Another educational feature of the research programs is the post-doctoral, non-degree training of fellows.

Future

A. Teaching

There will obviously be quantitative changes. Medical student class size will likely increase to 200 if not more, and similar if not disproportionate increases can be anticipated in the classes for others in the health science fields. The increase in number of graduate students is likely to be closely related to changes in size of the staff; the ratio of 4 to 6 students per professor will probably be maintained. Parenthetically, it might be noted that many faculty members of the basic science departments believe that there should be no limit on the number of qualified graduate students accepted into the school and that the staff size should be adjusted accordingly. Future programs for undergraduates in CLA

and IT depend on the development of the College of Biological Sciences.

With respect to qualitative changes, there should be continuing review of the curriculum and experimentation with new techniques. Curriculum changes might take the form of combining 2 or more basic science courses into a single integrated course, more effective correlation with clinical topics, some redistribution of credit hours, or inauguration of completely new courses. Changes in methodology might include adoption of programmed learning in some form, increased use of teaching aids like films and video tape, greater reliance on laboratory demonstrations as opposed to student experiments, etc. Any such alterations should presuppose the development of adequate means of measuring the consequences.

The changing roles of dentistry and other health professions may necessitate considerable upgrading and/or introduction of new basic science courses for students in these disciplines.

At present in most departments, the basic medical school course is also taken by graduate students. It seems likely that these two groups will be separated in the future with the medical course stressing general principles and clinical applicability and the graduate course concerning itself with the more detailed and complex mechanisms underlying the general principles.

B. Research

Future programs in research will be determined by individual investigators. It does seem likely that the trend will continue toward more fundamental investigations and away from those aspects closely related to an application.

**COMMITTEE FOR THE STUDY OF PHYSICAL FACILITIES
FOR THE HEALTH SCIENCES**

Basic Sciences Sub-Committee

Minutes of Meeting September 30, 1965 (#5)

Present: Eugene Grim, Chairman, Ellis Benson, Richard Bond, K. Gerhard Brand, Isabel Harris, Joseph Larner, Lee Wattenberg, John Westerma

Absent: Robert Isaacson

Guests: Richard Caldecott, Dean, College of Biological Sciences, William Shepherd, Academic Vice President, Martha Hostettler

NEXT MEETING: Wednesday, October 20, 3:30 P. M.

Chairman Grim introduced the guests and noted that this meeting was called at the suggestion of Dr. Learn at the September 13 Learn Committee Meeting. At that meeting Dr. Grim presented the Basic Sciences report. A question was raised about the relationship of the new College of Biological Sciences to certain graduate and undergraduate programs now being carried on by the College of Medical Sciences Basic Science Departments. Dr. Grim expressed the opinion that his sub-committee did not know as much as it would like about the new college. Dr. Shepherd remarked that the role and development of the new College of Biological Sciences will be shaped to some extent by the interaction with the basic sciences of the medical school. Dr. Grim then turned the meeting over to Dr. Shepherd and Dean Caldecott.

Dr. Shepherd traced the background of the development of the College of Biological Sciences (hereinafter referred to as CBS). A decision to re-locate Botany and Zoology was held up pending an overall review of the biological science programs in the University. Dr. Willey started the study and it had been going on for about a year when Dr. Shepherd assumed the position of Academic Vice President. At the end of another year's time, the study committee forwarded a report to all units of the University concerned with biological science. Certain modifications were incorporated in the report and it was then submitted to the Committee on Educational Policy within the University Senate. From the Senate it was sent to the Board of Regents via University Administration. As background for this group Dr. Shepherd quoted from certain portions of the Board of Regents minutes, dated July 10, 1964. For the record, the portion of the minutes relating to the establishment of the CBS is reproduced below.

INSERT MATERIAL FROM JULY 10, 1964 B of R MINUTES

College of Biological Sciences

The Vice President, Academic Administration, presented a plan for the focus of the total needs of the biological sciences through a new College of Biological Sciences.

Voted on the recommendation of the Vice President Academic Administration, the Vice President, Business Administration, and the President, to approve the creation of the College of Biological Sciences to be organized in accordance with the following recommendations of the Senate Committee on Educational Policy as approved by the Senate at its meeting of June 4, 1964:

1. That a College of Biological Sciences be established, with its chief administrative officer a Dean reporting directly to the President's Office. This college should provide the home for a core faculty in basic biology, with a recommended organization in terms of molecular, cellular, organismal evolutionary, and population biology.
2. That, initially, the College should be formed by the administrative and budgetary inclusion of faculty members of the existing Departments of Botany, Zoology, and Biochemistry (St. Paul), and of certain faculty members in genetics, biophysics, and other areas of biology.
3. That dual citizenship - by formal cross-charges, joint appointments, or other appropriate plans - be used from the beginning in order to include within the College representatives from the broad spectrum of biology throughout the University.
4. That the departments in the College of Biological Sciences offering majors leading to the B.A. degree be functionally a part of the College of Liberal Arts with the same responsibilities for liberal education as other departments in that College.
5. That the responsibilities of the new College shall be:

To provide leadership in the development at the University of a unified undergraduate program in biology, leading to appropriate Bachelor's degrees;

To provide course sequences needed to serve in the curriculums of the College of Liberal Arts and of other colleges;

To provide a new and significantly attractive visible structure for the recruitment of faculty and students for the development of biology;

To provide a home for a well-integrated group of biologists and thus

To provide a base for increased development of research and professional and graduate training programs both in the new College and in other areas of the University.

6. That a Consultative Council for Biology be established, appointed by the President with the advice of the Deans of the several colleges with relations to biology, under the chairmanship of Dean of the new College, to provide a channel for co-operative planning of programs relating to biology throughout the University.

7. That the requirements for the B.A. and the B.S. in Education with majors in the biological sciences be determined, as at present, by the College of Liberal

Arts and the College of Education, respectively; and that the requirements for the baccalaureate degrees to be given in collaboration with the All-University Council on Liberal Education.

8. That, initially, students enter the new College of Biological Sciences in the junior year.

9. That, since additional buildings and facilities for biology are needed on both the Minneapolis and St. Paul Campuses, all planning for such facilities be evaluated by a faculty committee including biologists from both locations.

10. That it is deemed advisable for the new Dean to establish his office initially on the St. Paul Campus; it is also deemed advisable to consider the appointment of an Associate Dean with an office in Minneapolis who might serve the College of Liberal Arts with respect to biology in the same way that the Associate Dean of the Institute of Technology serves with respect to physical science.

Documentation filed supplement to the minutes, page 16,873.

Voted further, to express the thanks of the Regents to the members of the Committee on the Development of the Biological Sciences for their long and devoted service to this assignment.

In quoting the above material, Dr. Shepherd noted that approximately 45 units of the University have a concern with the biological sciences. It is anticipated that this program will have activities on both campuses.

QUESTION: You mentioned that the St. Paul campus has a bio-chemistry department. What relationship, if any, does this department have to the one in the Medical School? Actually, there is no formal relationship. Going back to the point that the CBS will have overall basic courses while other schools will continue with their applied courses, such as medicine and agriculture. This does not preclude a relationship involving programs and faculty members. The CBS clearly recognizes the applied departments have an interest in this area. Meaningful dual appointments will be encouraged. Specifically with a reference to your question, the only existing relationship with CBS and CMS (College of Medical Science) with regard to the St. Paul Bio-Chemistry program is an informal joint agreement on requirements for graduate degrees. This has come about because it was so directed by the Graduate School. There is no push for cooperation at present, at the undergraduate level. It should also be pointed out that the CBS has been in existence for just a matter of weeks and there hasn't been time for this dual citizenship to develop in new areas. There is a carryover of some dual citizenships from the departments that comprise CBS.

QUESTION: In your statement, did you allow for the development of new departments? Yes, it is our intent to cover the whole spectrum of biological science activity. At present, we have botany, zoology, bio-chemistry and genetics. We do have plans for other departments or programs such as, biological engineering, bio-physics and microbial science.

I should like to point out that we are undertaking a study to identify what strengths we have in the CBS that we can build upon and also identify what are our deficiencies. Then we will be able to devise a more realistic program plan and project space needs.

Another basic position of the school is that basic biologic science teaching ought to be under the CBS. This does not preclude these courses being taught by other college faculties, but then the CBS ought to have a say about the content so they fit into the overall undergraduate program and the CBS ought to have the privilege of listing the courses in its catalog.

QUESTION: But the content of the course itself will be determined by someone outside the college teaching it?

COMMENT: This needs clarification. Some courses are designed for a specific public, such as medical students, agriculture students, etc. These courses won't be altered, although the CBS may try to make them broader. But the general courses must have a mandate from the CBS.

QUESTION: What will be the relationship of the undergraduate in say, physiology, and your school? We haven't come to grips with that yet.

QUESTION: At present, we determine the course requirements. In the future would it be the basic science department and the CBS?

COMMENT: Again this needs clarification. If you go back to the Board of Regents document, it states that the CBS will set requirements for courses in the basic sequence.

COMMENT: I would imagine it will take some work to determine what is a basic course. Yes, but I would assume that the men in the science departments could come up with some mutually acceptable definitions.

QUESTION: If I understand what you have been saying, you are not likely to organize an applied microbiology course, but might organize a department with microbiology scientists working on basic problems? Not precisely. I would say there are few good CBS in this country that don't have a microbiology department within the college. At present, we are not pushing for a department because there is one available. But we must get into the business of recruiting microbial scientists. The group then discussed the difference between microbial science and microbiology.

COMMENT: It should be noted that the CMS microbiology department has numerous graduate and undergraduate courses. Teaching medical students is a small part of the total load.

QUESTION: I detect a certain ambiguity in your remarks about the future of the CBS. There are certain undergraduate courses taught by other schools that you call acceptable, yet you want to hire more staff to develop your own programs in -

the same area. In the future, will we have to drop our undergraduate courses? Perhaps I can clarify this by citing the example of physics. I would envision the CBS serving the entire University as does Physics. All programs serving the entire University would be part of CBS, but not those serving special interest groups.

COMMENT: It seems that the CBS operates at two levels. You have responsibility for teaching undergraduate basic courses. If you had jurisdiction over the undergraduate programs we now have, the space implications would be minor. Only microbiology and physiology have a significant number of students. However, the graduate and research level is a different matter. If you envisioned jurisdiction here, then I'd be concerned as most of our load is in this area (not medical students) and if it were taken out, then this would be a major space factor for consideration.

COMMENT: Perhaps I can comment on this. There are times when academic lines blur at the graduate level. It could be we will have to take a look and regroup our graduate committees so there is a cross representation from CBS and CMS. Hopefully, students would go back and forth along this line and not be hindered by rigid academic lines.

QUESTION: Is there a graduate group committee for the basic medical sciences? Yes, I believe it is located in Rochester, Minnesota and on campus.

COMMENT: I would hope the student could go back and forth between the CMS basic sciences and the CBS. I would also hope the graduate committee would recognize that this is basically biology, and not agriculture or medicine.

COMMENT: Many of our graduate students in the basic sciences take no courses more closely related to medicine, than say physiology. Therefore there is not an excessive emphasis on medicine.

COMMENT: That is my point. Then why shouldn't these students be in the CBS? It would seem to make much more sense. Of course, this is a decision that will have to be made by the graduate school.

COMMENT: The CBS has a committee working with CLA on the development of the BA in CLA and the BS in the CBS. The BA program would not be as intensive as the BS and could be used for teachers who want a science major. The four year degree does not make a professional scientist of anyone.

COMMENT: One of the reasons for the basic science departments undertaking undergraduate courses is to get people with better preparation into the graduate program.

COMMENT: I agree, and that is one of the reasons for CBS. With the whole CBS faculty looking at programs, higher minimum standards should be set and the entire program should be stronger than in the past.

QUESTION: For the CBS to accomplish its goals, what physical facilities are in the immediate planning stage and what are the probabilities for facilities in the future? Perhaps I could help answer this one by explaining where we are at the moment. At the last legislative session we requested the construction of a wing on the Zoology Building. We are short on laboratory space for undergraduate biology students. In the long term the life sciences also need space so we planned to ask for the completion of the new chemistry building rather than phasing two buildings, which is very expensive. This would have provided more space than chemistry needs at present, but the extra space would be compatible with the needs in biology. We could have stubbed in the services. However, the legislature gave us funds for phasing the buildings.

If we can build a phase of the chemistry building and the same for biology we will relieve the pressure for space. We are adding space in St. Paul also. So the plan to build in front of zoology and tie into botany is in abeyance. There was then a discussion of physical developments in the CBS St. Paul campus.

In the future, the CBS does plan to develop a graduate program. This will have an impact on the CMS but there is nothing to report at present as the CBS faculty is undergoing the aforementioned survey to determine 1) where the excellence is within the school and 2) where the shortcomings are.

COMMENT: From now until the 1970's, the growth of the St. Paul campus should be the same as the Minneapolis Campus.

COMMENT: I'm interested in your remark about the future of the St. Paul campus in that you mentioned the development of a teaching-research building. In the CMS we developed differently. First we had the faculty, then the graduate research students and then the space. It sounds like you are going to get space for graduate students but I presume you are assuming that you will get faculty to go along with the space and graduate students. Yes, this is largely a matter of semantics. We will grow much as you have in the CMS. Also I could envision a facility where any number of people would take up residence for a portion of a project. That is various groups would come in and occupy space for a period of time and then a new group would come in on the same project. There was then a description of how general science space is used in the IT research program.

QUESTION: If the student had an advisor in the CMS, could this man use a laboratory on the St. Paul campus? Yes.

COMMENT: At the last Learn Committee meeting when our group reported, we were asked to consider the suggestion that some of our graduate student and research activities be located away from the present space.

COMMENT: Yes, I believe Dr. Learn was thinking of building peripheral facilities to the health sciences campus. The faculty then might move to this building, coming back to the main complex to teach. The space science center is an example of how this can work. The Minneapolis faculty should have space on the St. Paul campus to work with its students.

QUESTION: Is there a possibility of the CBS teaching a course in fundamental genetics to the medical students? Definitely yes.

COMMENT: This is what I was suggesting earlier.

COMMENT: For example, a geneticist in the CBS might teach a course to medical students. If, however, the CMS wanted to get involved, then the CBS man might move to the CMS faculty. If CMS is not satisfied with the CBS course, then the CBS would try to adjust the course to serve the CMS. We will now be teaching the same genetics course in Minneapolis and St. Paul. It will not be called agriculture genetics or zoological genetics, but simply genetics.

COMMENT: Microbiology for medical students doesn't include population genetics.

COMMENT: I would resist CMS teaching a basic course in genetics.

QUESTION: What % of the CBS will be in St. Paul? Minneapolis? ten years from now. I'd like to comment on that. I think there is no answer at present but it is clear that we need biology on both campuses. There will be course offerings on both campuses and faculty and students will move back and forth.

COMMENT: If we can only get one building, the preference would be in St. Paul because the greatest need is there. The CBS committee was not resistant to the idea of the professor moving back and forth between campuses. This is not too much to ask of the professor.

COMMENT: However, I would like to point out that we must make it easy for the professors to move back and forth. Transportation must be improved.

COMMENT: I think there is a danger of a real collision between CBS and CMS because CMS has been moving more and more to fundamental science.

COMMENT: This issue was solved about 10 years ago in math and physics without difficulty.

COMMENT: I would like to be able to call on the physiology faculty to teach courses, for example, membrane physiology.

COMMENT: Again, I am worried over the idea that in the future major biologic innovations will be on the St. Paul Campus.

COMMENT: We can't move all the faculty and students to the St. Paul campus. They will be needed on both campuses.

QUESTION: Did you envision the graduate advisory committee would be intra- or inter-college composition? Inter-College.

Respectfully submitted,

John H. Westerman
Executive Secretary

**COMMITTEE FOR THE STUDY OF PHYSICAL FACILITIES
FOR THE HEALTH SCIENCES**
Basic Sciences Sub-Committee

Minutes of Meeting October 20, 1965 (#6)

Present: Eugene Grim, Chairman, Ellis Benson, K. Gerhard Brand, Isabel Harris, Robert Isaacson, Joseph Larner, Kathryn Ritzén, John Westerman

Absent: Richard Bond, Lee Wattenberg

Guest: James Stephan, Professor and Associate Director, Program on Hospital Administration

Chairman Grim stated that the purpose of this meeting was to sound out the committee's opinion on some basic questions relating to space needs of the Basic Science Departments.

QUESTION: How important is it for Basic Sciences to be geographically close to the Clinical Departments? Is it more important for Basic Sciences to be close to the Clinical Departments than Public Health, Nursing, or Dentistry, for example? Should we move out of this area or should some other department? Dr. Learn has indicated that in the future some departments may have to move out of this area, so we must carefully consider the prospect of our doing so or the reasons for not doing so. Should we be more closely related to the College of Biological Sciences?

How far away do you have in mind when you mention moving? The football practice field or the St. Paul Campus. Well, wherever we are located we need to have easy access to the clinics, especially in view of the type of climate we have out here, which could make outdoor access from a great distance a real hardship at times. It wouldn't be too bad to be located on the football field, provided there is ease of communication with the center complex.

The Clinical Departments themselves feel the need to stay close to Basic Sciences, so that consideration should be given due weight.

QUESTION: Why does any aspect of the College of Medical Sciences have to move? Dr. Learn made this statement at the last meeting of the Parent Committee, that we can't just build upward; Mr. Close has a figure that forbids unlimited vertical building, so we must be prepared to consider possible moves away from this complex. However, the validity of Mr. Close's figures should be considered most carefully. Some of the committee felt that Basic Sciences should stay right in the complex, since it has the greatest right and need to be

located here. However, a location connected to the main complex by a tunnel to avoid carrying experiments outside would be acceptable also.

There is one significant difficulty to moving further out on the perimeter of the complex, and this is one Dr. French has mentioned, i. e., the ideal situation is to have laboratories, offices and teaching units adjacent. However, as Dr. Learn pointed out, when all of these components are put together in a sizable, growing unit, this relationship can't be strictly preserved anyhow. Therefore, we must face the need to consider what can be separated from the core with the least ill-effects? If we're going to grow, separations will develop - a certain distance from the other departments - but we must come up with a ranking of necessary proximities among the various departments. We accept that the Clinical Departments must be close to the Hospitals. Should the Basic Sciences be close to the Clinical Departments? Public Health, for example, has admitted that it could build on Oak Street, although they don't wish to be removed from the central core either. But if Basic Sciences feels that it must be close to the Clinical Departments, then it will have to marshal arguments in favor of this position. Perhaps the strongest argument is that the Clinical Departments themselves say they need us to stay close to them, and we feel a complimentary need to stay close to them. Basic Sciences could exist, if they had to, without the Clinical Departments, but they could not exist without us.

QUESTION: Is there any way in which the Basic Sciences Departments could be split up? For example, the new research facilities might be separated from the rest (the offices and teaching labs). I personally dislike this, since it is time-consuming to travel between office and research lab. Also, it would split the staff into those mostly in research and those mostly in teaching.

QUESTION: A corollary question to the ones we've been considering is, are there branches of the University which Basic Sciences must be near? It is important for Basic Sciences to be within a reasonable distance of Chemistry and Physics. We are against moving the entire medical center to St. Paul, for example. All of these questions will be framed and have to be faced in the future. Suppose the College of Biological Sciences really developed into a first class organization, would Basic Sciences be better separated from them or from here? Where are our priorities? It seems that our priorities are here, near Chemistry, Physics, Mathematics. There is a great deal of space pressure to build a lot of the College of Biological Sciences on the St. Paul campus; therefore, we have to see whether it becomes of such a quality that we miss having it here.

QUESTION: In regard to space requirements, accepting the likelihood of 200 medical students, the increased number of courses to be taught to Dental students, more ancillary students - Med Tech, OT, Nursing, although we're not sure of our response about Nursing (there will be increased needs in the graduate Nursing program) - is it possible to put lecture space at a distance from the departments?

Several blocks away, for example? We have to consider student travel to these lecture halls also, but that's not likely to be a problem. Lecture facilities could then feasibly be separated.

QUESTION: Is it possible that the College of Biological Sciences will be teaching undergraduate survey-type courses to technologists? No, not for some time, at least not those courses taught to professional students, possible to graduate students, definitely to CLA and IT students.

QUESTION: Could student laboratory space be shared among several departments and could those labs be physically separated from their present home base? There seems no reason why this can't be done, because teachers won't be in two places at the same time, they can't be in the labs while they're in lectures. Then lecture-student laboratory space could possibly be moved from the present office-research lab space. Student-laboratory space could be separated, but sharing that space is another question. Our labs are presently filled and crowded all week long. However, we're talking about this, if there are 200 medical students, we will have to have new labs, and this new lab space could possibly be shared, while keeping the present lab as is. One problem in sharing the laboratory is that rigid scheduling is necessary to make it work and you lose flexibility that way. It should be kept in mind, however, that it's not likely one laboratory would be shared by all six departments of Basic Sciences. We would have to consider the differences in curriculum and hourly changes in lab occupancy.

QUESTION: Would the new laboratories be used by medical students exclusively? If so, they shouldn't be far from the present set-up, because we have to prepare the media used in the labs for experiments and demonstrations. Maybe we'd even need extra personnel if the new labs are at a distance, just to take care of these things, and perhaps it would be easier to provide more personnel than to enlarge the present space.

QUESTION: Are the Basic Science labs separated now from department space? Yes, but all of the student labs and preparation rooms are in the same place now. Having two laboratories will automatically increase the necessary personnel; two labs, for example, will require two stockroom attendants.

QUESTION: Can we anticipate more esoteric equipment in the future which will have to have space in student labs? The equipment is esoteric enough now, if you ask me. However, we will need more space for equipment.

QUESTION: Should the numbers of graduate students expand independent of any increase in the number of staff to handle technologists medical students, etc? In other words, should we permit the number of graduate students to expand of its own accord and get staff just to take care of the increased graduate students?

QUESTION: What's the ratio of graduate students now? Four to five per professor, on the average. This is determined by the total number of professional staff, which in turn is determined by the number of medical students and dental students we teach.

QUESTION: Doesn't this ratio vary with the interests of the individual professor? Oh yes, there is some variation, but not much; it's pretty constant. Actually, the numbers of graduate students have not been a problem until recent years, since there didn't used to be enough to saturate the staff. Now, there are potentially more than the present staff can handle. This is a very important consideration for space requirements, because each new staff member requires one- to two thousand additional square feet of space.

The number of graduate students we should have is actually a philosophical question. The key to developing new medical institutions is having enough staff to fill them, and this is derived from training graduate students. By and large, such staff come out of Basic Sciences graduate schools, even those who go into clinical departments. So, it seems wise, then, to expand our staff to handle an increased number of graduate students.

There was some question as to whether the number of medical students absolutely controls the number of staff, since a certain number of staff is always required just to cover all of the pertinent fields. Historically, the staff has grown in relationship to the numbers of medical students. Graduate student increases follow the addition of faculty. However, we have hired new people in the past few years with soft money to teach in new fields. These people have been hired without strict regard to the number of medical students, and thus the number of graduate students has been able to increase at a faster pace.

One has to decide whether it's justifiable to spend more State dollars to supply the needs of the nation at large. Another fundamental question is, what should be the ratio of State to Federal dollars in training people to satisfy national needs? It is likely that in the future there will be increasingly more Federal support, in recognition of the fact that many State University medical schools are often supplying more than State needs. This has already been recognized in the case of the School of Public Health, for example, where it receives 90% of its support from the federal government. There are a great number of areas in the health science complex which are not so recognized now.

QUESTION: Getting back to the relationship between staff and the number of medical students, I disagree that there is no absolute ratio. Increased numbers of students always requires more staff, for laboratories especially. This is analogous to staff in the clinical area. Of course, but what I really meant was that we need a lower limit of staff to teach each area.

QUESTION: Mr. Stephan acknowledged that parameters can be drawn around the numbers of medical students, but wondered whether parameters can so easily be drawn around graduate students? In Basic Sciences, a graduate degree is a research degree, the students turn in research which has to be evaluated; this requires staff time. Historically, this has been a problem, because medical schools are not training their fair share of graduate students

QUESTION: Does the 4 - 6 figure of graduate students per professor include students in another discipline doing graduate work in Basic Sciences or are these all professional Basic Sciences graduate students? Whether they are doing research and taking staff time determines whether they are counted in the Basic Sciences figures.

QUESTION: Is there any way to determine the number of Ph. D.'s in clinical fields who train in Basic Science departments? Some might be taking a Surgery Ph. D. with a thesis in Physiology. In looking at training needs across the country, some Ph. D.'s will go into basic sciences, while others will go into clinical fields. Both types of students are attached to the Basic Science Departments.

QUESTION: What about the influence of the College of Biological Sciences on students that Basic Sciences now teaches in CLA, Agriculture, IT? It will not make much difference in space requirements, since these students for the most part have no labs and mainly share lectures with other health profession students.

QUESTION: If the College of Biological Sciences becomes really strong, will it have an impact in drawing students from your own areas, in Biology for example? Technicians, nurses, etc. require introductory courses that are medically oriented, which Biological Sciences can't teach for us at present. It might possibly cut the Basic Sciences' student population. On the whole, however, it does not seem that the development of the College of Biological Sciences will have space implications for Basic Sciences, unless there is some move from Basic Sciences to the College of Biological Sciences.

QUESTION: This is directed at Mr. Stephan. How best does one decide the amount of space needed? Do you relate it to the number of staff or the number of students? You do both, you relate it to the number of students, undergraduate, medical, graduate, and post-doctoral, and to the number of faculty. You won't attract faculty without a certain amount of research space. In the past, for each staff member, about one to two thousand square feet of space, including administrative office space and shared equipment, has been necessary. Do these space figures you cite usually take into consideration the number of graduate students? Research space is related to graduate students; lecture and student laboratories are related to other kinds of students. Precise information about these needs can be gathered only from the departments themselves. It's hard for us to determine the number of graduate students, because the amount of

research dollars usually determines this.

QUESTION: To what extent is this committee able to conclude that we need X number of square feet of space? A professional space consultant will be working with the committee members to figure this out. Of course, we have to make sure to whom which space belongs. We must relate present space to present programs, and gauge how students and programs will grow, then predict the space that will be required. The committee can't do this all by itself, but it can help the professional space planners with priorities.

We must keep in mind that the faculty is doing the planning, which is not the usual case. So there will be more individual interviewing in the departments and then you will need to make judgments about your findings. The Learn Committee meeting planned for November 22 will be mainly concerned with just such priorities of program changes, finances, etc.

In view of the importance of the next Learn Committee meeting and the hiring of a space consultant to provide further guidance as to the next steps which the Basic Sciences Committee should take, Dr. Grim set no date for the next subcommittee meeting, but will inform members when it seems wisest to hold the next meeting.

Respectfully submitted,

Kathryn Ritzen
Research Assistant

COMMITTEE FOR THE STUDY OF PHYSICAL FACILITIES
FOR THE HEALTH SCIENCES

Basic Science Subcommittee

Minutes of Meeting December 9, 1965 (#7)

Present: Eugene Grim, Chairman; Ellis Benson, Robert Isaacson, Kathryn Ritzen, John Westerman

Absent: Richard Bond, Gerhard Brand, Isabel Harris, Joseph Larner, Lee Wattenberg

NEXT MEETING AT THE CALL OF THE CHAIRMAN

Dr. Grim began by stating that the purpose of the meeting was to review the Preliminary Report of the Learn Committee and make suggestions on any changes or additions that seemed necessary.

The first question that came up concerned the specifics of the Learn Committee Report, i.e. what specific suggestions for the Health Sciences are made, what is the proposed calendar of development, what plans have the highest priority? It was pointed out that the first report is only a Preliminary Report, and we will be able to be more specific after the space study is completed and there is time for more conversations with all the department chairmen.

Some suggested that the Basic Sciences section of the report would be strengthened by emphasizing the factors requiring more space for the Basic Science departments: 1) increased enrollment to meet manpower pressures, with the demand for basic sciences graduate students being equally great as if not greater than the demand for medical students, with 2) the resulting need for more faculty to meet the needs of the phenomenon. The sentiment clearly was to take a positive stand in the Basic Sciences section of the Report on graduate student teaching.

Such a position is further supported by the expected emergence of more clinical research centers, which will require more basic sciences support. If these programs are to be attracted to Minnesota, it's necessary to maintain and even strengthen the basic sciences here. In this regard, there is the philosophical question whether clinical research will grow by participation of the Basic Science departments, or whether the Basic Science departments will grow into more clinically oriented science. In our own situation, joint appointments of faculty would seem the ideal solution, but this is not often a realizable solution because two departments are not always equally willing to hire on that basis.

Much of the meeting's discussion centered around the relationship between the Basic Sciences and the newly created College of Biological Sciences. One question was, how much Basic Sciences work could be moved into the College of Biological Sciences? This has an important bearing on how much support the Basic Sciences can continue to give the Medical School.

Another question was whether there is any reason not to favor the College of Biological Sciences' taking on undergraduate Biology courses. The reaction to this was, if the College of Biological Sciences develop strong biological sciences departments, the Basic Sciences would be glad to turn this function over to them.

The main reason why the Basic Sciences are now involved in undergraduate instruction is to get undergraduates to take more Math and Physiology than they would normally. Microbiology might hold a different opinion on what the CBS could take over, because Microbiology does a unique job in teaching a large number of undergraduates. It's likely, however, that they, too, would hand over this assignment if CBS could take it on. There does seem to be a certain amount of duplication with CBS which we haven't yet come to grips with, but perhaps we need to wait until CBS's plans are further worked out.

The important point which the committee wanted to emphasize in the Learn Committee report was that the Basic Sciences have vital relationships with the College of Medical Sciences clinical science departments, as well as with Physics, Math and Chemistry. The Basic Sciences want to see these relationships maintained and strengthened, and this requires maintaining geographic proximity to them. At the same time, taking into account its first priority relationships, the Basic Sciences favor a positive relationship with the College of Biological Sciences, a relationship which, however, is handicapped by geographical separation.

A few other changes to the Basic Sciences section of the Preliminary Report were suggested. It was felt that item d. on page 6 should be appended to emphasize that the Basic Sciences graduate program is a major source of all research investigators, including those in the clinical fields. It was hoped that the Clinical Medicine section of the Report would express support of a strong tie with the Basic Sciences.

Another proposed alteration to the Report was that, while no radical changes in the Basic Sciences are foreseen at present, curriculum review may lead to some changes and therefore, we can't make any important predictions about programs until curriculum review takes place.

The chairman concluded the meeting by informing the members that further meetings will be held later on, after progress is made on the space study and after the Preliminary Report has made an impact and produced some feedback. The second phase of the Health Sciences study might also entail some additions to the Basic Sciences Subcommittee to carry out the more detailed planning required.

Respectfully submitted,

Kathryn Ritzen
Research Assistant

COMMITTEE FOR THE STUDY OF PHYSICAL FACILITIES
FOR THE HEALTH SCIENCES
Basic Sciences Subcommittee

Minutes of Meeting May 19, 1966 (#8)

Present: Eugene Grim, Chairman; Ellis Benson, William Felts, Isabel Harris, Robert Isaacson, Jack Miller, McCollum Brasfield, Edmond Nelson, Kathryn Ritzen

Absent: Richard Bond, Gerhard Brand, Joseph Larner, Lee Wattenberg

NEXT MEETING: THURSDAY, JUNE 16, 1966 at 3:30 P. M. in 424 MILLARD HALL

Agenda: 1. Tentative Proposal for Expansion of Health Sciences
2. Examination of size of basic sciences graduate program

1. Dr. Grim traced the background of the space consultants' proposal to accommodate future health sciences expansion (for full details see Parent Committee Minutes of May 9, 1966). The plan, which calls for a new dental facility, freeing dental space in Owre, and the School of Nursing to vacate Millard Hall, would allow the Basic Sciences to expand by about 70,000 square feet. Microbiology expansion is not part of this proposal, although it is programmed to expand within Mayo.

The committee had several questions on the proposal. Since the expansion takes into account an entering class of 200 medical students, there was some question of how long the Medical School could expect to keep the legislature from asking for a class of 250 medical students. Some members also wondered why a second medical school was not the proposed solution to increasing the number of physicians graduating each year.

Another question which arose was, why not build a new Basic Sciences building instead of remodeling the entire Basic Sciences complex? There are many reasons why this won't be possible in the foreseeable future. The Regents have committed themselves to building a new dental and outpatient facility. There is no apparent alternative use of the vacated dental area and it would be extremely difficult to justify the destruction of existing space while asking for new construction. Besides, it's possible to get NIH funds to pay all of the costs of remodeling in connection with research projects, whereas at best one could get only matching funds for new construction. Most importantly, up until now the Basic Sciences subcommittee has not indicated a great need for a brand new building.

Alternative ways to expand the basic sciences were considered. To fill in Owre square would be too expensive. To bridge across the present Mayo garage entrance, which is not included in the present proposal, could be done for future expansion. The next major task for the subcommittee is to determine, with the consultants' help, exactly how much space Basic Sciences will need, up through 1975. 2. The other important business for the subcommittee is to arrive at a policy governing the size of the graduate student teaching program. It's very important for the space consultants to have this information from us. Up to now the number of graduate students has been determined largely by the number of faculty needed to teach the medical and dental students. The question is whether this is the best way to determine the size of the graduate student program.

At the Parent Committee meeting of April 21, President Wilson indicated that he had serious reservations about continuing to enlarge the graduate program on an unplanned basis. It would seem the reason for this attitude is the fear that the undergraduate program would otherwise be neglected. Another reason would be the finite resources of the University cannot accommodate unlimited expansion. Dr. Grim asked the subcommittee its views about this issue. Would the faculty favor staff expansion solely to accommodate an increased number of graduate students? Dr. Miller replied that Pharmacy now has an average ratio of 3 to 5 graduate student per faculty person and he would not favor any ceiling on the size of the graduate program. Dr. Larner had previously indicated to Dr. Grim that there is no danger of turning away graduate student applicants in Biochemistry. Clinical Pharmacology will definitely grow.

Dr. Benson said that the big need is to provide good facilities for the faculty in order to attract good graduate and post-graduate students. At the same time, the faculty will continue to do a good job of teaching medical students. Dr. Felts also thought that space was a crucial factor in controlling the growth of the graduate program. Anatomy cannot accept more graduate students without more space, and it's not likely that the program will expand out of control if only two or three rooms are allotted to a professor. Perhaps the best approach is to think in terms of an average amount of space required for each professor and that would include room for graduate students.

Actually, there is ample justification for increasing the graduate program aside from expansion of the medical student class. One reason is to meet the demand for men trained in the Basic Sciences who will be the future professors. Another is that we attract out-of-state interns and residents to our graduate programs who often remain in the state. The very teaching of basic sciences depends on staff research using graduate students. However, the administration and the legislature need to be convinced before the basic sciences will receive support on this policy, particularly since there already is greater receptivity in the legislature to an increase in the number of medical students.

The next work of the Basic Sciences Subcommittee is to make some guesses about the average number of graduate students per professor and the basis for determining the size of the graduate program. As part of this process, we ought to be able to determine the number of majors in each basic science department. It is hoped that a representative from each department will be present at the next meeting on June 16 at 3:30 in 424 Millard Hall.

Respectfully submitted,

Kathryn Ritzen
Research Assistant

COMMITTEE FOR THE STUDY OF PHYSICAL FACILITIES
FOR THE HEALTH SCIENCES

Basic Sciences Subcommittee

Minutes of Meeting June 16, 1966 (#9)

Present: Eugene Grim, Chairman; Ellis Benson, Gerhard Brand, William Felts, Robert Isaacson, Joseph Larner, Jack Miller, Lee Wattenberg, McCollum Brasfield, Edmund Nelson, Kathryn Ritzen

Absent: Richard Bond, Isabel Harris

NEXT MEETING AT THE CALL OF THE CHAIRMAN

Dr. Grim distributed a list of tentative proposals, drawn up by the space consultants and based on the Preliminary Report, for the expansion of the health sciences. The list also contained questions regarding the proposals on which Dr. Grim requested the subcommittee members to obtain the opinions of their departments. Specifically, information is needed from the department chairmen on the present amount, type and adequacy of space for the present program, as well as a determination of the present number and categories of graduate students. This type of quantitative information is necessary for compiling the final report, a draft of which must be submitted to the parent committee by October 1, 1966.

As a guide for gathering data for the report, Mr. Nelson distributed several lists and work sheets:

- a. Present space allotted to each basic science department
- b. Worksheet to evaluate the adequacy of existing space for the present program
- c. Number and types of students projected for 1973 and 1986
- d. Faculty and staff projections
- e. Projected staff/student questionnaires

Mr. Nelson is available and willing to help subcommittee members in their space evaluations.

The use of multi-discipline laboratories was discussed at length. Since a great deal of lab space will be required to accommodate growing enrollments, not only for those in the basic sciences but also for other students, such as medical technologists, it may be feasible to combine the labs for teaching. This could be done with proper scheduling and departmental ownership of specialized equipment. Increasingly the clinical laboratories will have to be the primary teaching laboratories, because service laboratories are becoming automated. However, many problems such as the optimum numbers to be taught at one time and whether teaching will be strictly departmental or inter-departmental, would have to be solved if multidiscipline labs are to be used successfully.

The other major topic discussed was the size and status of the graduate student program in the basic sciences. The Preliminary Report indicated the phenomenal growth of the graduate programs, but did not relate it to any base figures. Dr. Grim expressed the wish to have the opinions of all the basic science departments on the emphasis which should be given to the graduate program. Dr. Brand pointed out that graduate students play the primary role in teaching medical and dental students. Therefore, to teach larger classes of medical and dental students, it is more important to increase the number of graduate students than the number of professors.

Dr. Grim concluded the meeting by asking the committee members to have their departments hold staff meetings to discuss these issues and provide the necessary information outlined above. This information should be sent to Dr. Grim by August 1, in time for a progress report to Dr. Learn. This same data will be discussed at a meeting in September and will provide the basis for the quantitative report due by October 1, 1966.

Respectfully submitted,

**Kathryn Ritzen
Research Assistant**

Committee for the Study of Physical Facilities for the Health Sciences
Basic Sciences Subcommittee

Minutes of Meeting November 10, 1966 (#10)

Present: Eugene Grim, Chairman; Gaylen Bradley, William Felts, Isabel Harris, Robert Isaacson, Jack Miller, Lee Wattenberg; McCollum Brasfield, Edmund Nelson, Kathryn Ritzen.

Absent: Ellis Benson, Richard Bond, Joseph Larner

NEXT MEETING: Wednesday, November 23, 1966, 3:30 P. M., 424 Millard

1. The subcommittee met to discuss completion of the final Basic Science Report, for submission to the Learn Committee early in December. The remaining work concerns justification of faculty and space requests (eliminating any duplications therein), and some revision of the preliminary report's role and program statement. Dr. Grim told the committee he would submit to them copies of a draft of the final report, for their comments and criticism, in time for the next meeting.

2. Staff Requests. Dr. Grim pointed out that Dr. Learn had said the University would use a student-faculty ratio of 6.3:1 to justify new faculty in the health sciences. Therefore, any faculty increases which exceed this ratio will require sound justification. Since Anatomy and Pathology have requested faculty increases proportionately greater than those in the other basic science departments, these increases will require appropriate justification.

3. Space Requests. The total Basic Sciences space estimates exceed the 69,000 square feet of additional space likely to be available, but the estimates represent the frank opinion of the Basic Science departments and the subcommittee as to minimal future space needs. It is assumed that the Naegle property is only for temporary use and won't be ready in 1973.

a. Animal quarters. The possible effects of federal legislation regarding animal quarter standards was discussed, and the committee concluded that future animal quarter needs were actually likely to be far greater than those estimated. It has been estimated that 50% more space will be required just to house the present number of animals. It was suggested that animal quarters be built under Union Street, when the new facilities are constructed, freeing other space in the basic science area.

b. Multidiscipline Laboratories. The committee concluded that, given the projected number of medical-dental students, and the number of hours per week they will require in the labs, the use of multidiscipline teaching labs would not result in any saving of space. Each department would still require its own stock-room, would still keep its own research labs, where other undergraduate students are taught, and more staff would be needed to manage both the teaching and research labs.

Page 2. Cont.

At present, physiology and Pharmacy share a virtual multidiscipline lab. Microbiology is severely cramped for laboratory space for CLA students, graduate students and students in other disciplines doing work in Microbiology.

The committee acknowledged that there might be pedagogical reasons for multidiscipline labs, requiring a radical change in present teaching methods. But the argument for such labs cannot be predicated on space saving in this particular situation.

c. Centrally Assigned Classrooms. The problem of using centrally assigned classrooms which are becoming too small for increasingly large classes, was brought up. The committee felt that its report should clearly note the need for additional lecture space.

Respectfully submitted,

Kathryn Ritzen
Research Assistant

Committee for the Study of Physical Facilities for the Health Sciences

Basic Sciences Subcommittee

Minutes of Meeting November 23, 1966 (#11)

Present: Eugene Grim, Chairman; Ellis Benson, Gaylen Bradley, William Felts, Robert Isaacson, Joseph Larner, Jack Miller, Lee Wattenberg, Edmund Nelson, Kathryn Ritzen.

NEXT MEETING: AT THE CALL OF THE CHAIRMAN

The Subcommittee made several comments on the report of the Basic Sciences Subcommittee to the Committee for the Study of Physical Facilities for the Health Sciences:

1. A problem of accounting exists for those students housed in one department who are majoring in another department. There is also a problem of identification of teaching assistants, who are not included in the Basic Sciences' staff requirements. Discussion also centered around the point of whether a stronger sentence or paragraph should be included in the report regarding the importance of graduate students in the teaching program.
2. Subcommittee members are certain that the College of Medical Science Educational Policy Committee will propose curriculum review, which will change the time medical students will spend in basic sciences. The innovations in the curriculum will surely result in greatly expanded space needs. The report given the Parent Committee is an estimate of minimal needs to care for expansion of present programs. There is no flexibility or versatility of programs possible with these requests. The discussion of multidiscipline laboratories is an imaginative part of the program and should be included in the final report.
3. Are the Curriculum Committee's options limited by the physical facilities planning? The general answer to this was, "Yes, to some extent." This report to the Parent Committee is the status quo report, since program changes based on more space were not elicited. This could not be avoided, however, since the Curriculum Committee is still in a very general stage of planning. An addendum with an escape clause regarding the effect of curriculum review is suggested.
4. Another suggestion is that the Committee should show figures of personnel needed now, with possible comparisons of the University of Minnesota with other comparable institutions. The Committee agreed that a statement be made regarding faculty-student ratios.
5. Another comment is that graduate students lack study space and therefore projections of cubicles for medical students or graduate students is not at all unrealistic. However, this space is extensive. The Committee agrees that space changes will return from curriculum program changes and is in favor of estimating problems resulting from curriculum change.

Dr. Grim will make the suggested changes in the report and sent it to the Committee members for approval. Dr. Grim thanks the Committee members for their efforts.

April 20, 1967

Received By
Assistant Director's Office

APR 25 1967

UNIVERSITY HOSPITALS

Dr. Eugene Crim
Department of Physiology
472 Lyon Laboratories
East Bank

Dear Dr. Crim:

As you are aware, Mr. Peacock and Mr. Nelson have met with all the chairman of the Basic Science Departments. On the basis of their findings I had a conversation with Vice President Shepherd and Dean Howard. We are agreed that the editing committee's recommendations should be modified. We propose to increase the basic sciences total net square feet by 18,000 square feet to 241,200. I would hope that it will be possible for your subcommittee, in consultation with department chairmen, to prepare a revised distribution of space among the various areas that is consistent with the new total of 241,200 square feet. I am certain that Mr. Peacock, Mr. Nelson, and Mr. Brasfield would be happy to lend any assistance they can.

I regret that it was impossible for us to recommend the total space as suggested by the subcommittee, but I am sure that you and the other members of your group understand the limitations within which we must operate.

Thank you for your cooperation.

Sincerely,



Elmer W. Learn
Assistant to the President

EML:ap

cc: Shepherd, Howard, Westerman, Peacock, Nelson, etc.

UNIVERSITY OF *Minnesota*

UNIVERSITY OF MINNESOTA HOSPITALS • MINNEAPOLIS, MINNESOTA 55435

RECEIVED
UNIVERSITY HOSPITALS
SEP 13 1967
Director's Office

September 11, 1967

TO: Elmer W. Learn, Assistant to the President
FROM: McCollum E. Brasfield, Assistant Executive Secretary
SUBJECT: Basic Science Areas.

Enclosed are the detailed space requirements for expansion of the existing programs for the Basic Science areas. Dr. Grim wishes for us to keep in mind that the reductions in the total space and the reductions in these detailed categories are all arithmetic reductions. That is, that the subcommittees have not closely examined all of the figures. The Basic Science Sub-Committee is glad to provide these detailed figures for the architects work with, however, and of course, are looking forward to working with the architects on the more specific details of the schematic drawing.

db.

cc: ~~Mr. John Westerman~~
~~Dr. Eugene Grim~~

Table 4. Summary of Space Requirements

For expansion of present programs

| | Present Space | Increase Needed Now | Additional Need for 1973 | Total Increase | 1973 Space |
|-------------------------------|------------------|------------------------|--------------------------------|-------------------|---------------|
| Anatomy | 36,200 | 775 | 11,325 | 12,100 | 48,300 |
| Biochemistry | 23,900 | 9,040 | 9,460 | 18,500 | 42,400 |
| Microbiology | 22,400 | 2,180 | 7,920 | 10,100 | 32,500 |
| Pathology | 26,800 | 8,265 | 3,135 | 11,400 | 38,200 |
| Pharmacology | 18,000 | 9,730 | 7,870 | 17,600 | 35,600 |
| Physiology | 32,300 | 3,310 | 8,590 | 11,900 | 44,200 |
| TOTAL | 159,600 | 33,300 | 48,300 | 81,600 | 241,200 |
| Total (excl. Microbiology) | 137,200 | 31,120 | 40,380 | 71,500 | 208,700 |

Other

Laboratory facilities related to joint biomedical-engineering-physiology program----4,000 ft.²

Lecture hall for seating 350 students----3,000 ft.²

Possible 25% expansion of present plus requested animal quarters to conform with new animal legislation----5,500 ft²

Table 2. Space Requirements for Expansion of Existing Programs

| Department | Staff and office* | lab Teaching Lab | Animal Quarters | Dep't Office | Seminar Room | Totals |
|--------------|------------------------------|------------------------|--------------------|-----------------|-----------------|--------------|
| | Needed now | 775 | -- | -- | -- | 775 |
| Anatomy | Additional need* for 1973 | 5,120 | 3,880 | 1,090 | 1,090 | 145 11,325 |
| | Needed now | 7,100 | -- | 385 | 145 | 1,410 9,040 |
| Biochemistry | Additional need for 1973 | 4,730 | 4,730 | -- | -- | 9,460 |
| | Needed now | 1,780 | -- | -- | 400 | -- 2,180 |
| Microbiology | Additional need for 1973 | 4,150 | 1,980 | 1,190 | 400 | 200 7,920 |
| | Needed now | 7,100 | -- | 780 | 385 | -- 8,265 |
| Pathology | Additional need for 1973 | 2,355 | 780 | -- | -- | -- 3,135 |
| | Needed now | 7,410 | -- | 1,170 | 930 | 220 9,730 |
| Pharmacology | Additional need for 1973 | 3,935 | 3,935 | -- | -- | -- 7,870 |
| | Needed now | 1,970 | 550 | 790 | -- | -- 3,310 |
| Physiology | Additional need for 1973 | 4,580 | 1,575 | 1,575 | 630 | 230 8,590 |
| | Needed now | 26,135 | 550 | 3,125 | 1,860 | 1,630 33,300 |
| TOTAL | Additional need for 1973 | 24,870 | 16,880 | 3,855 | 2,120 | 575 48,300 |
| | Total to 1973 | 51,005 | 17,430 | 6,980 | 3,980 | 2,205 81,600 |

*This column includes areas used in common by entire staff such as cold rooms, radioactive counting rooms, etc. It also includes nearly all graduate student desk and laboratory space.

THE ARCHITECTS COLLABORATIVE INC.

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*At Expt
Anatomy*

JEAN B. FLETCHER
1945 - 1965
NORMAN FLETCHER
WALTER GROPIUS
JOHN C. HARKNESS
SARAH P. HARKNESS
LOUIS A. MCMILLEN

RICHARD BROOKER
ALEX CVIJANOVIĆ
HERBERT GALLAGHER
WILLIAM J. GEEDIS
ROLAND KLUVER
PETER W. MORTON
H. MORSE PAYNE, JR.
ERNEST L. BIRDSALL
TREASURER

July 3, 1969

Mr. Hugh G. S. Peacock
University Planner
University of Minnesota
2675 University Avenue S.E.
St. Paul, Minnesota

RE: Health Sciences Expansion -- Department of Anatomy

Dear Hugh:

In a recent conversation Bob Mulhausen noted that Dr. Lazarow, head of the Department of Anatomy, was concerned that, under the present phasing schedule, existing space planned to be vacated for Anatomy expansion would not be available until Unit 'A' is completed (now scheduled for completion in September 1973).

Since the increase in class size is scheduled for September 1973, it will be necessary to have sufficient Gross and Microscopic Anatomy labs to accommodate the student increase at that time.

I spoke on the phone with Dr. Lazarow on June 27 about this problem, and the following two alternatives evolved as possibilities for further consideration:

1. Find temporary space for space now occupied by the Anatomy Department electronics maintenance shop (now in Room 382 Jackson) and Information Retrieval Facilities (now in Rooms 374 and 378). This would allow immediate expansion for gross anatomy laboratories on the same floor as the remainder of the existing Gross Anatomy labs.
2. Attempt to accelerate the early completion of those parts of Unit 'A' which would allow earlier remodeling of those existing spaces to be vacated by Dentistry and Basic Sciences for expansion of Anatomy facilities mentioned above. This would require early completion of Pathology teaching labs on floor 3 and Periodontics clinics on floor 6 in Unit 'A'.

I have set up a tentative meeting with Dr. Lazarow on July 14th at 1:30 PM to discuss these and any other alternatives prior to the site visit.

UNIVERSITY OF Minnesota

H. S. Extr.
Basic Science

OFFICE OF THE PLANNING COORDINATOR
2675 UNIVERSITY AVENUE • ST. PAUL, MINNESOTA 55114

1 August 1969

Dr. Eugene Grim
424 Millard Hall
East Bank Campus

Dear Dr. Grim:

Received By
Assoc. Director's Office
AUG 1969

UNIVERSITY HOSPITALS

The National Institutes of Health Site Visiting Team requires a further explanation of how the Basic Sciences teaching laboratories serve the dental and medical students. The laboratory sizes must be reconciled with the class sizes and curriculum.

Would you please arrange a meeting with Drs. Mulhausen and Holland and those Department Chairman who have teaching laboratories in Unit A? The situation must be clarified so that a statement can be included in our application. Vern Ausen is available to assist you in this. I would like this prepared by August 13th, the date of our next Design Coordinating Committee Meeting. I realize there are some problems involved with this but we must satisfy N.I.H.

Sincerely,

Hugh

Hugh G. S. Peacock
University Planner

cc: Mr. V. Ausen
Dr. M. Holland
Dr. R. Mulhausen
Mr. T. Smith ✓

UNIVERSITY OF Minnesota

H.S. E+
Basic Sci.

UNIVERSITY HOSPITALS • MINNEAPOLIS, MINNESOTA 55455

August 18, 1969

NOTES ON MEETING WITH BASIC SCIENCE CHAIRMAN

August 8, 1969

Present: Dr. Frederick Shideman
Dr. Dennis Watson
Dr. James Dawson
Dr. Wallace Armstrong
Dr. Dwight Anderson
Dr. Robert Mulhausen

Dr. Mellor Holland
Mr. Hugh Peacock
Mr. Vernon Ausen
Mr. C. Thomas Smith
Mrs. Elizabeth Grundner

Dr. Mulhausen explained that the NIH site visit team expressed concern about the various sized basic science laboratories and the resultant sectioning required since some are not able to handle entire class sizes. The Dental Curriculum is described in the grant applications as not corresponding with space available. There was no mention of sectioning dental classes in the narrative. Present need is to either support the existing arrangement by changing the dental curriculum or changing the size of the teaching laboratories. It has been suggested that a standardized size to accommodate a hundred fifty students be planned. It was pointed out that such a plan would require more space either through a bigger building, through less support area, or by taking away space from other departments.

The meeting concluded with Dr. Mulhausen asking the Dental School Curriculum Committee to meet with the chairman of the Basic Science Departments on potential arrangements for sectioning the Dental class. Dr. Holland will coordinate this effort. In addition, Dr. Mulhausen asked Dr. Armstrong to assist him in drafting a statement on how the basic science teaching labs will be used. Both of these steps will have to be completed before September 1st.

Respectfully submitted;

C. Thomas Smith, Jr.

CTS:pi



HEALTH SCIENCES CENTER

UNIVERSITY OF *Minnesota*

UNIVERSITY HOSPITALS • MINNEAPOLIS, MINNESOTA 55455

August 12, 1969

BASIC SCIENCE TEACHING LABS

| <u>Department</u> | <u>Student Stations</u> | <u>Deficit</u> | <u>Average Sq. Ft./Student</u> |
|-------------------|-------------------------|----------------|--------------------------------|
| Microbiology | 150 | 0 | 24 |
| Pathology | 112 | -38 | 27 |
| Pharmacology | 144 | - 6 | 32 |
| Physiology | 144 | - 6 | 32 |
| Biochemistry | 120 | -30 | 50 |



HEALTH SCIENCES CENTER

Science Labs

August 27, 1969

Statements in re Laboratory Facilities in Building A

for Teaching of Health Science Students in Biochemistry

TO: Dean Howard, Dean Cavert, Dr. Mulhausen, Mr. Peacock, Mr. Smith and
Mr. Turner

FROM: W.D. Armstrong

These statements are prepared and submitted so that they can be studied by the addressees before our meeting in early September to develop revised plans for transmission to the N.I.H for certain laboratory teaching facilities.

(1) Of the total area (45,340 S.F.) eventually allocated to the department for all purposes the best judgement, arrived at by full study and consultation and by giving consideration to space requirements of other departmental functions, was that an area of 12,225 SFN should be apportioned to these kinds of undergraduate "health science" teaching functions.

(2) The three main teaching laboratories (rooms A2-150, A2-152 and F2-161) are each designed for 32 students with each room divisible by a moveable partition into two sub-units for 16 students each. Thus 96 students could be accommodated at one time in scheduled laboratory work. In the original presentation to the TAC architects four such rooms each at 1500 SFN were requested. I assume that the number of these rooms was reduced to three because of design characteristics of the building and because of the circumstances of available space in the building.

The areas of the three rooms (50 sq. ft/student) were so planned, in consultation with Mr. Turner, for three reasons: (1) To allow bulky equipment (refrigerated centrifuges, fraction collectors, spectrophotometers, hoods, steam baths, etc.), some of which would be floor mounted and other items would occupy wall and shelf space, to be readily accessible to small groups of students, (2) to facilitate teaching by providing arrangements by which small groups of students could interact with a teacher via discussions and intimate faculty - student contacts, and (3) to escape from the disturbances and loss of student morale attendant on the use of large and crowded student laboratories (a situation which we have had for years).

In my judgement it would be a mistake to allow more than 40 students of any sort in one of these rooms at any one time. To do so would be a sacrifice of the educational goals upon which our plans based on recognizable principles have been developed.

(3) Room A2-162 (advanced students laboratory) was planned for use by students in Phase D programs and by other medical (or dental) students who may elect advanced laboratory work in biochemistry. This room will provide 1,537 SFN; down from 4,000 SFN requested.

Suggestions that this room be converted to scheduled laboratory teaching are not acceptable because to do so would destroy the whole thrust of the new curriculum in so far as work in biochemistry beyond Phase A is concerned. This room must be available for student use at any and all times, as determined by the students' other activities, and the students must be allowed to maintain their laboratory set-ups intact between periods of work. Any other arrangement will make this kind of work unappealing to the students and impose limitations on the kinds of work they can do.

I also find unacceptable the suggestion that this room (A2-162) be used partially for scheduled laboratory work (by dental students) and partially for its designed purposes for reasons presented in the paragraph below.

(4) The suggestion has been made that some of the space in Millard Hall which is to be remodeled several years hence for use by the biochemistry department be diverted to the purposes for which room A2-162 was designed. This is unacceptable to me because our allotted space for staff laboratories, support areas, graduate student laboratory, etc. is already much below our realistic needs which will be developed as the staff grows in number (see long letter, in these regards, dated December 30, 1968, addressed to Dean Howard, Dean Cavert, and Dr. Learn by the staff of the department). Also, such a manipulation would postpone for several additional years the activation of many of our plans for Phase D teaching. During this protracted period our department and staff would, I am sure, be put into a situation of remoteness from the continual education of medical students from which we could not recover.

(5) I knew that the Dental School is planning for a student body of 150. However, I was not aware of that school's plan to have all of its students attend laboratory at the same time until the day of the site visit of the N.I.H. team. I had supposed that the Dental School, like the Medical School, would use sections of students. Therefore, the circumstances which have developed so as to require us to submit plans for student laboratories to accomodate 150 students at one time could not have been foreseen by me.

(6) I consider that the only solution to this problem which would not compromise educational goals and the role of biochemistry in health science

education is to provide an additional area to accomodate 30 students in scheduled laboratory work. I submit that a plan presented to the N.I.H. by which 150 students are put into the space properly designed for the training of 96-120 students by modern methods will be unacceptable to the N.I.H. and I would regard it as one in which educational goals are adjusted to the building and not the other way about.

(7) The biochemistry support areas are already at the minimum and cannot, without grave sacrifices, be converted to any other use.

(8) In conversations by telephone I have twice suggested to Mr. Turner, and also to Dean Howard, that Room A2-112 might be utilized to provide the extra space demanded by these circumstances. This room is labeled "Student Study and Lounge". I find it a matter of regret to have to be in a position to suggest a reduction in student amenities. However, we are faced with a virtual demand by the N.I.H. to provide an expansion of teaching facilities, and priorities have to be determined as circumstances require.

One way to utilize room 112 for teaching purposes would be to move the microbiology functions planned for rooms, 178, 179, 180, 181 and 182 into room 112 and to redesign a portion of rooms 178-182 for use as a biochemistry teaching laboratory for 30 students. This suggestion would have the advantage that the added biochemistry teaching laboratory would be located near the support rooms.

A less desirable solution would be to convert about two-thirds of room 112 to an advanced student laboratory for biochemistry and to redesign room 162 as a laboratory for scheduled work.

UNIVERSITY OF Minnesota

H.S. EXP
Basic Science

DEPARTMENT OF PHYSIOLOGY
424 MILLARD HALL • MINNEAPOLIS, MINNESOTA 55455

February 3, 1970

Dr. Robert O. Mulhausen
Assistant Dean
College of Medical Sciences
1360 Mayo

Dear Dr. Mulhausen:

This is in answer to your letter of December 19, 1969 concerning Mr. Roland Kluver's question about module size in basic science teaching labs.

The BHSC discussed this at its last meeting and asked me to inform you that the variation in module size from department to department arises from the differences in teaching methods imposed by the differences in the several disciplines. We see no advantage to a fixed module size and, indeed, see many disadvantages. So long as each laboratory can accommodate 150 students total, there should be few problems in adapting to possible future changes in curriculum.

Sincerely yours,



Eugene Grim
Professor and Head

EG:ea