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**FUTURE PLANNING FOR THE HEALTH SCIENCES**

**COLLEGE OF PHARMACY**

**PART II. STAFF AND SPACE PROJECTIONS**

College of Pharmacy  
University of Minnesota  
Minneapolis, Minnesota

November 1, 1967

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## I. INTRODUCTION

The Long Range Planning Committee for the Health Sciences was appointed in October 1964 by President Wilson. In March 1966 the Deans of the College of Pharmacy and the College of Veterinary Medicine were appointed to this Committee.

The Committee for the Study of Physical Facilities for the Health Sciences published its first report entitled, "Future Planning for the Health Sciences, Part I. Preliminary Report on Roles, Objectives and Programs" on January 1, 1966. The second report, "Future Planning for the Health Sciences, Part II. Program and Personnel Space Projection" was published in October 1966. The third report, "Future Planning for Health Sciences, Part III. Subcommittee Program and Space Reports" was published in February 1967.

The College of Pharmacy published within its own faculty its first report, "Future Planning for the Health Sciences--College of Pharmacy" on January 19, 1967. In this report it was concluded that "The College of Pharmacy must become an intimate part of the health center complex with regard to academic programs and to location." The Committee for the Study of Physical Facilities for the Health Sciences accepted the recommendation without dissent. The College of Pharmacy was asked to prepare a detailed report covering program, staff and space projections. A "Joint Program Statement of the College of Pharmacy and the College of Medical Sciences/University Hospitals" was published in August 1967. The purpose of the present report is to present staff and space projections for the College of Pharmacy. An attempt has been made to present data in

a form in which it can be easily compared with that furnished by the other health professions and presented in their third report mentioned above.

## II. PHARMACY MANPOWER-STATE OF MINNESOTA

No report on the present status or future need of the pharmacy profession in Minnesota is available. Information on the need has been obtained through Mr. Paul G. Grussing, Executive Secretary, Minnesota State Board of Pharmacy, whose invaluable assistance we wish to acknowledge. This is presented below and has served as a basis for projected need.

The total number of registered pharmacists engaged in practice in the state and the annual number of graduates from the College of Pharmacy are graphically presented in Figure 1. The projections for the total pharmacists needed in Minnesota beyond 1966 are based on Federal Bureau of Census figures furnished by the Minnesota Department of Health. These plus the factor of 1 pharmacist for 1500 people, which is considered optimum, was used to determine the points on the pharmacy graduate curve for 1970, 1975, and 1980. The projections for graduates in pharmacy for 1968 and 1969 are based on present enrollments in these classes. The remainder of the curve is based on projected graduates of about 100/year by 1973 and 125/year by 1986.

There are several other factors which will greatly influence future pharmacy manpower needs. Three of the most important include:

1. Ages of Pharmacists Engaged in Practice: The most complete available data is for the year 1965. At that time there were 2122 pharmacists active in the state.

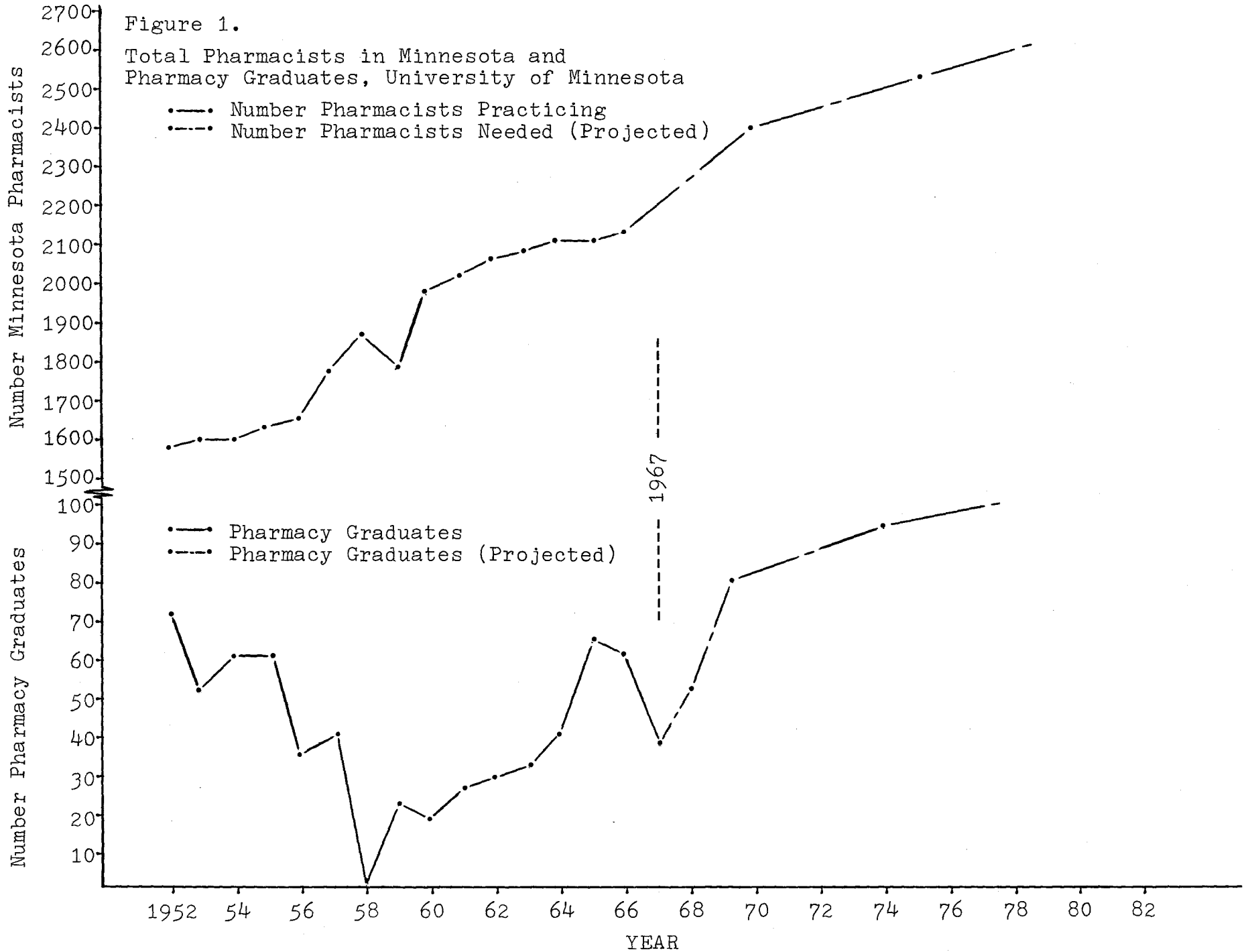


Table 1

Ages of Pharmacists Engaged In Practice  
(Minnesota, 1965)

<u>Years of Age</u>	<u>Number</u>
Under 30	318
30-39	544
40-49	401
50-59	390
60-64	207
65-over	<u>262</u>
Total:	2122

Not included in this is a group of about 500 "inactive" pharmacists who have been forced into relief roles because of pharmacy shortages. About 250 of these are asked to work at least 75% of a full-time schedule. For the most part this group would normally be classified as retired.

2. Hospital Pharmacy: In 1952 there were 36 hospitals employing 54 pharmacists. In 1967 there were 181 pharmacist practicing their profession in 68 hospitals. Recent Medicare legislation requires hospitals and nursing homes to have a pharmacist or the consultive services of a pharmacist in order to qualify; the pharmacist is responsible for compounding and dispensing. A survey of pharmacy service in smaller hospitals in the state of Minnesota by W. E. Peterson in 1963 showed that 184 hospitals existed. Of these, 116 had 100 beds or less. Only 17.1% formally utilized the services of a pharmacist at that time.

3. Changing Role of the Pharmacist: A discussion of this area appeared in the first report from the College of Pharmacy. The interested reader should consult this report (a copy can be obtained from the College of Pharmacy office).

A realistic estimate of the needs for pharmacists in Minnesota over the next two decades can be made. However, this estimate must be based on our present understanding of the role of the pharmacist.

Table 2

Estimate of Minimal Pharmacist Manpower Needs for Minnesota  
(1966-1986)

Demand	Number of Pharmacists Needed
Pharmacists needed to take care of population increase:	677
Pharmacists lost due to retirement or death--Ages in 1965: 50-59 (390); 60-64 (207); 65+ (262) and one-half of these 40-49 (401).	1059
Pharmacists needed to fulfill need brought about by new government regulations. Small hospitals (100 beds or less). Boarding care homes and nursing homes (about 500). Calculation based on 1 hour/1 day/6-day week.	75

The above estimate does not take into account manpower needs due to predicted greater involvement of the pharmacist in the total health care program. Another factor which is presently quite controversial and might have a beneficial effect on the shortage of pharmacists is the strong possibility in the future of "pharmacy technicians." It would be expected that pharmacists would gain time to devote to functions of their professional practice which are presently being slighted. It might not increase the actual number of pharmacists available for professional practice. The College of Pharmacy could be involved in the training of these "pharmacy technicians " if they become a reality.



### III. EXISTING PROGRAMS

The objectives of the College of Pharmacy are: 1) to educate men and women of ability, integrity, and character to identify, prepare, formulate, and distribute drugs and other health aids; 2) to disseminate information about the uses and value of scientific medicine; 3) to win and deservedly keep public confidence and respect for the profession of pharmacy; 4) to aid the state and federal governments to control habit-forming drugs to enforce all laws for public welfare; 5) to encourage original work and study by qualified persons who will make unselfish use of their services in the interest of health sciences; and 6) to assist public health agencies in the prevention and control of diseases.

Beginning in 1892, the University of Minnesota awarded the Ph.G. degree for two years of professional pharmaceutical study. A program requiring a minimum of three years of study leading to the Phm.C. (pharmaceutical chemist) degree was adopted in 1915-16 but was abolished in 1927-28 when four-year course leading to a B.S. (bachelor of science) degree in pharmacy was instituted. Increasing responsibilities of the pharmacist and expanding opportunities for the graduate of a college of pharmacy made necessary a further extension of the curriculum. Through actions taken by the American Association of Colleges of Pharmacy, a minimum five-year curriculum became mandatory in 1960 in all colleges of pharmacy for a degree in pharmacy.

Pharmaceutical education has progressed rapidly and soundly, keeping pace with advances made in medicine, dentistry, veterinary medicine, and the other health sciences. Progress in pharmaceutical education necessiated an extended program with the following objectives: 1) greater emphasis on cultural courses which "broaden" the student's knowledge and enhance the prestige of the profession; and 2) reduction in the clock-hour load which in the four-year curriculum was too heavy because of the large number of

laboratory courses. In the five-year curriculum the student has the opportunity to elect a wide variety of courses and to engage in many of the beneficial extracurricular activities of the University. By these means the student can enjoy the intellectual and social growth that is so important in his future position as a professional member of society.

Students are admitted to the four-year professional course in the College of Pharmacy on completion of one year of accredited collegiate work. Students applying for the three-year professional course must have completed, in addition to the courses of the prepharmacy year, courses in basic biological sciences (botany and zoology or equivalent course in general biology), physics, organic chemistry, and general economics, which are equivalent to those listed in the pharmacy curriculum.

Students who complete either the 1-4 (one year of prepharmacy work plus four years of professional study) or the 2-3 programs are awarded the degree, Bachelor of Science in Pharmacy.

Graduate study with major work in medicinal chemistry, pharmaceuticals, hospital pharmacy, pharmacognosy, and pharmacology, leading to the degrees of Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) is offered through the Graduate School.

#### IV. NEW PROGRAMS

Several new programs have been initiated. Additional programs are in the planning stage. Several of these should be mentioned.

1. New and planned graduate training programs. Because of the shortage of trained individuals in medicinal chemistry, pharmaceuticals,

pharmacognosy, hospital pharmacy and pharmacy administration, graduate training programs will be established in all these areas. A medicinal chemistry training grant from the Public Health Service was approved, funded and initiated on July 1, 1967. A training grant in pharmaceuticals is currently under review. A graduate program in pharmacy administration is presently under study by the College and the Graduate School. It is anticipated that this program will be available for the 1968-69 academic year.

2. Undergraduate training in clinical pharmacy. The projections have been presented in some detail in the report "Joint Program Statement of the College of Pharmacy and the College of Medical Sciences/University Hospitals" (copy available from College of Pharmacy or University Hospitals). This important program projects the use of hospital facilities in a manner not unlike those required by medicine and dentistry. The addition of several pharmacy practitioners will be necessary to staff the new clinical pharmacy area to aid in the training of undergraduate pharmacy students. The many experimental projects planned will require supporting personnel (i. e. drug information systems).

3. Curriculum Changes. The changing roles of the pharmacist require that a greater future emphasis be placed on the biological areas. As a result of an "in depth" review of our curriculum, additional coursework in pharmacology and public health were recommended by the faculty of our College. In addition, it is hoped that a new course in pathology for pharmacists can be arranged. The pharmacist must be increasingly concerned with and knowledgeable about the overall health care of the patient. The study of the future needs of this profession and the resulting requirements on our curriculum continues.

4. Continuing Education. During the past year we have been experimenting with different types of programs to assist the practitioner of pharmacy. These will be developed further during the coming years. Through the Committee for Institutional Cooperation we have initiated meetings with member universities with colleges of pharmacy with two goals in mind: 1) to develop regional programs in pharmacy continuing education and 2) to develop the mechanism whereby such continuing education programs can, in part, be attacked on a national basis to take advantage of the best talents and decrease the local load. Further, we believe that the University of Minnesota health professions might benefit by looking into some cooperative programming and staffing.

#### V. STUDENT ENROLLMENT

The projections are shown in Table 3. We believe that the undergraduate projections are conservative, based on the estimated needs for the state of Minnesota. However, this seems justified if one accepts the fact that, presently, the two Dakota schools train more students than are needed in their respective states. In recent years active registrants in pharmacy in the state of Minnesota who were graduates of North Dakota and South Dakota have been consistently about 20% and 10%, respectively. The rather large number of pharmacists from these two schools now practicing in this state results at least in part from the fact that the University of Minnesota instituted the five-year program about six years before the other two schools. However, as more Minnesota graduates become available fewer graduates of schools in the Dakotas will be needed.

A factor which cannot be measured accurately is the likelihood

Table 3

UNIVERSITY OF MINNESOTA COLLEGE OF PHARMACY

Existing and Projected Student Enrollment

<u>Category</u>	<u>Existing 1967</u>		<u>Projected 1973</u>		<u>Projected 1986</u>	
	<u>Entering</u>	<u>Total</u>	<u>Entering</u>	<u>Total</u>	<u>Entering</u>	<u>Total</u>
Undergraduate	100	300	125	400	150	560
Graduate (includes Post-doctoral)						
Hospital Pharmacy		10		15		30
Medicinal Chemistry		20		35		50
Pharmaceutics		8		20		40
Pharmacognosy		3		7		12
Pharmacy Administration		0		3		10
Continuing Education		250		1,000		1,200

that the University of Minnesota will be offering an optional six-year program leading to the degree of Doctor of Pharmacy within five years. The California state schools have been on the six-year program now for several years. More recently optional programs have been offered by the University of Michigan, Ohio State University, Philadelphia College of Pharmacy and Tennessee. Several other schools are contemplating such offerings. It seems that the greatest effect will be on the need for additional faculty and the number of students in training and not the number of eventual graduates.

Graduate enrollment is expected to grow rapidly as our training grants become operative. Finally, continuing education will become a very important segment of our education. At least one state now requires participation in postgraduate programs for continued licensure. As better programs of pharmacy continuing education become available, other states will undoubtedly have such requirements.

## VI. FACULTY & STAFF

The projections are shown in Table 4. It is difficult to project needs in the new clinical pharmacy area since there is very little experience upon which to draw. Most schools having any program similar to the one we are planning are also in the early stages of planning. It is anticipated that practitioners who have other responsibilities will prove the most useful in the educational program. It is feared that the projections here will prove inadequate, particularly over the shorter period. The projections in the other areas appear conservative.

Table 4  
UNIVERSITY OF MINNESOTA COLLEGE OF PHARMACY  
Existing and Projected Faculty and Staff

PROGRAMS AND ACTIVITIES	<u>Full-time Faculty</u>		<u>Part-time Faculty</u>		<u>Civil Service</u>			
	<u>Total</u>	<u>Univ.</u>	<u>Total FTE</u>	<u>Univ.FTE</u>	<u>Total Tech.</u>	<u>Univ.Tech.</u>	<u>Total Non-Tech.</u>	<u>Univ. Non-Tech.</u>
<b>I. TEACHING (UNDERGRADUATE AND GRADUATE)</b>								
Clinical Pharmacy	1-2-4*	1-2-3	0-6-20	0-4-15	1-2-4	1-2-4	0-1-3	0-1-3
Medicinal Chemistry	5-7-10	5-6-8	0.1-2-3	0-0-0	1-1-1	1-1-1	0-1-2	0-0-1
Pharmaceutics	4-7-10	4-6-8	0-1-2	0-0-0	1-1-1	1-1-1	0-1-2	0-0-1
Pharmacognosy	2-4-7	2-3-5	0-0-0	0-0-0	0-0-0	0-0-0	3-3-3	3-3-3
Pharmacology	2-4-4	2-2-3	0-0-0	0-0-0	0-0-0	0-0-0	0-0-0	0-0-0
Pharmacy Administration	2-3-5	2-3-4	0-0-0	0-0-0	0-0-0	0-0-0	0-1-1	0-1-1
<b>II. RESEARCH</b>								
Clinical Pharmacy	0-2-3	0-0-1	0-0-0	0-0-0	0-1-2	0-0-0	0-1-1	0-0-0
Medicinal Chemistry	0-2-4	0-0-1	0-0-0	0-0-0	0-2-3	0-0-0	0-1-1	0-0-0
Pharmaceutics	0-2-4	0-0-1	0-0-0	0-0-0	0-2-3	0-0-0	0-1-1	0-0-0
Pharmacognosy	0-1-2	0-0-1	0-0-0	0-0-0	0-0-0	0-0-0	0-0-0	0-0-0
Pharmacology	0-1-1	0-0-0	0-0-0	0-0-0	1-2-2	1-2-2	0-0-0	0-0-0
Pharmacy Administration	0-1-2	0-0-1	0-0-0	0-0-0	0-0-0	0-0-0	0-1-1	0-1-1
<b>III. SERVICE</b>								
Administration	1-1-2	1-1-2	0-1-1	0-1-1	0-1-1	0-1-1	3-4-6	3-4-6
Data Storage, Retrieval and Processing	0-0-2	0-0-1	0-0-0	0-0-0	0-1-3	0-1-2	0-1-2	0-1-2
Audio Visual	0-0-0	0-0-0	0-0-0	0-0-0	0-1-3	0-1-3	0-1-1	0-1-1
Instrument Repair - Photography	0-0-0	0-0-0	0-0-0	0-0-0	0.5-1-2	0.5-1-2	0-0-0	0-0-0
Reading Room (Student lounge)	0-0-0	0-0-0	0-0-0	0-0-0	0-0-0	0-0-0	0-1-1	0-1-1
Continuing Education	1-2-3	1-2-3	0-0-1	0-0-1	0-0-0	0-0-0	0-1-2	0-1-2
<b>IV. SUMMARY</b>								
Teaching	16-27-40	16-22-31	0.1-9-25	0-4-15	3-4-6	3-4-6	3-7-11	3-5-9
Research	0-9-16	0-0-5	0-0-0	0-0-0	1-7-10	1-2-2	0-4-4	0-1-1
Service	2-3-7	2-3-6	0-1-2	0-1-2	0.5-4-9	0.5-4-9	3-8-12	3-8-12
<b>TOTAL:</b>	<u>18-39-63</u>	<u>18-25-42</u>	<u>0.1-10-27</u>	<u>0-5-17</u>	<u>4.5-15-25</u>	<u>4.5-10-18</u>	<u>6-19-27</u>	<u>6-14-22</u>

\*Figures represent needs for 1967-1973-1986 in the order given.

Explanation of headings:

1. Total -- complete faculty, technical or civil service needs.
2. Univ. -- requested support from University funds for College of Pharmacy budget.
3. FTE -- full-time equivalent.
4. Tech. -- technical.
5. Non-tech. -- Non-technical (clerical, gardeners, etc.).

## VII. SPACE REQUIREMENTS

The projections are shown in Table 5. We are presently pressed for space, a condition which will become serious because of our decision to delay a request to the Legislature for funds to add a wing to the present building. The College of Pharmacy faculty made the decision to delay this request in order that a study could be made of pharmacy's future needs. If the recommendations presented in the first report are accepted, the College of Pharmacy will be moved to a yet undecided site within or next to the other health sciences. The programs, some of which have already been initiated, will require the space projected in Table 5.

It should be emphasized that no classroom or library space needs were projected.

## VIII. SUMMARY

The proposals made by the faculty of the College of Pharmacy in their several reports represent a significant departure from the College's programs in the recent past. The present and future roles for the practicing pharmacist must be correctly interpreted by us so that the right educational experience will be available to our students. It is obvious that the pharmacist is going to play an ever increasing role in total health care in the future. This will require him to become more patient (and disease) oriented; he is presently drug oriented. Thus, clinical pharmacy, an increase in biological science offerings and more intimate contact with other undergraduate health professionals become important factors in his training.



Table 5

UNIVERSITY OF MINNESOTA COLLEGE OF PHARMACY

Existing and Projected Space

<u>Activities</u>	<u>Existing</u>	<u>Net Square Feet</u> <u>1973</u>	<u>1986</u>
Faculty Office		6,370	11,700
Faculty Research Laboratories	3,095*	12,740	23,400
Teaching Laboratories	10,045	11,524	17,286
Research	6,980	32,000	56,800
Administration	1,772	3,000	3,600
<u>Service</u>			
Teaching Service**	3,225	7,644	10,372
Instrument repair, photography	196	400	600
Audio-visual	-	300	600
Data handling	-	600	800
Locker room - lounge (student)	1,439	3,000	4,500
Animal rooms	353	1,000	2,000
Greenhouse facility***	3,643	1,000	1,000
TOTAL:	30,748	79,578	132,658

\* Existing space for office-laboratories.

\*\* Stock rooms, storage and rest rooms.

\*\*\* Wulling Hall space released to University 1185 sq. ft. Additional space (lecture rooms) expected for research and offices in 1968, 1109 sq. ft. in Appleby Hall.

In the graduate areas we are uniquely qualified to train young people for careers in teaching and/or research. We have at this University all the supporting areas needed to offer outstanding graduate programs in medicinal chemistry, pharmaceuticals, pharmacognosy, hospital pharmacy and pharmacy administration.

To realize success in these areas we must have, as a minimum, the staff and space indicated in the report (Table 6).

Table 6

UNIVERSITY OF MINNESOTA COLLEGE OF PHARMACY

Summary of Existing and Projected Faculty and Space

<u>Item</u>	<u>Existing</u>	<u>1973</u>	<u>1986</u>
University Budgeted Full-time Faculty	18	25	42
University Budgeted Part-time Faculty, Full-time Equivalents	0	5	17
Net Square Feet Space*	30,748	79,578	132,658
Undergraduate Enrollment	300	400	560
Graduate Enrollment	41	80	142

\* Excludes all lecture room space, library and laboratory space used by supporting basic sciences. Includes laboratory space for pharmacy courses.

UNIVERSITY OF *Minnesota*

UNIVERSITY OF MINNESOTA HOSPITALS • MINNEAPOLIS, MINNESOTA 55455

January 18, 1968

TO: Mr. Peter Sammond, Associate Director, University Hospitals

FROM: Mr. Thomas F. Jones, Assistant Director, University Hospitals

SUBJECT: Pharmacy Space Projection

The Pharmacy Planning Committee reports that the following space requirements may be cut to help bring the total hospital square footage cost within the funds available.

<u>PROGRAM OR AREA</u>	<u>SQUARE FOOTAGE CUT</u>	
Control Lab	500 sq. ft.	(*work area for Pharmacy student research)
Outpatient.. Common Lobby	800 sq. ft.	(*reading and work area for medical staff and students)
Drug Information	800 sq. ft.	(*reduction in number of satellites from 9 to 7)
	<hr/>	
Total.....	2900 sq. ft.	
	<hr/> <hr/>	
 <u>ADDITIONAL</u>		
Nursing <del>Units</del>	<del>5000</del> <sup>560</sup> sq. ft.	(Remove 560 sq. ft. from nursing unit space which had been designated as Pharmacy offices now to be served by satellites in Pharmacy space projection)

PHARMACY

1. What relationship will the undergraduate and graduate programs of the College of Pharmacy have with:

- |                               |                               |
|-------------------------------|-------------------------------|
| a) biological sciences        | f) hospital                   |
| b) physics dept.              | g) dental school              |
| c) chemistry dept.            | h) basic sciences             |
| d) economics dept.            | i) public health              |
| e) other depts. of University | j) other health science units |

2. Will these relationships be influenced by enrollment patterns, i.e. number of students applying for five-year program, four-year program, three-year program, etc.; and if so, will this make a difference in determining preferred physical location of College of Pharmacy? What effect would a six-year program have on these relationships?

3. Space projections do not include space required for classrooms or library. Is it expected that Pharmacy will share classrooms with nearest adjacent health science unit? Has the demand for classrooms been estimated? What is the size of undergraduate and graduate classes?

4. How important is the present physical relationship to Biomedical Library? to other libraries on the River campus? Will the relationship change based on new program?

5. How will the proposed clinical pharmacy program differ from the present program? What are the physical space implications of such a program?

6. What relationships will the following College of Pharmacy programs have to others in the health science area:

- |                      |                         |
|----------------------|-------------------------|
| a) instrument repair | d) animal rooms         |
| b) data handling     | e) continuing education |
| c) audio-visual      | f) shop area            |

7. Should the College of Pharmacy plan for

- |                      |                              |
|----------------------|------------------------------|
| a) central stockroom | b) central glassware washing |
|----------------------|------------------------------|

8. What will be the manufacturing requirements for the IESC? Where should they be located?

9. How much space will be required for solvent storage?

10. Should distilled water be furnished all laboratories from a central area?

11. Will a separate balance room be necessary?

12. How much and what kind of portable equipment will be used. Who will be using this equipment?
13. Will there be a central instrument room? What physical relationship should it have to the various departments?
14. Will animals need to be held in or near research facilities? Will this be for short periods of time? What relationship should this space have to the HSC animal rooms?
15. How many laboratories will require electrical shielding against 60-cycle current interference?
16. Individual lockers will be required for students. Should these be in a lockroom or should they be built into the corridor walls, flush, on all floors except the main floor.
17. Will facilities be needed for radioisotope handling and study? Must it be in the general College of Pharmacy area?
18. Student lounges will be needed. Will separate lounges be needed for women? What should their relationship be to those in the other HS areas?
19. What is the space needed for undergraduate laboratories in the various pharmacy disciplines? Is the sharing of laboratories possible between disciplines? by other departments in the HSC?
20. Area graduate laboratory (student) needs similar enough that general types of laboratories might be preferable over specific laboratories for each discipline? Would a mixture of the two types be desirable?
21. Are faculty office-laboratories preferred?
22. Will there be need for special laboratories such as a "sterile products" laboratory? What should be its location relative to the Pharmaceutics Department? University Hospitals? Will cold rooms be needed?
23. What are the need for conference rooms? Student activities office?

TAC

PHARMACY

1. What relationship will the undergraduate and graduate programs of the College of Pharmacy have with:

- |                                       |                               |
|---------------------------------------|-------------------------------|
| a) biological sciences                | f) hospital                   |
| b) physics dept.                      | g) dental school              |
| c) chemistry dept.                    | h) basic sciences             |
| d) economics dept.                    | i) public health              |
| e) other departments of<br>University | j) other health science units |

2. Will these relationships be influenced by enrollment patterns, i.e. number of students applying for 5-year program, 4-year program, 3-year program, etc., and if so, will this make a difference in determining preferred physical location of College of Pharmacy?

3. Space projections do not include space required for classrooms or library. Is it expected that Pharmacy will share classrooms with nearest adjacent health science unit? Has the demand for classrooms been estimated? *What is size of grad + undergrad classes*

4. How important is the present physical relationship to Biomedical library? to other libraries on the River campus? Will the relationship change based on new program?

5. How will the proposed clinical pharmacy program differ from the present program? What are the physical space implications of such a program?

UNIVERSITY OF *Minnesota*

OFFICE OF THE PRESIDENT • MINNEAPOLIS, MINNESOTA 55455

January 23, 1968

TO: College of Pharmacy Committee

- ✓ Dr. Lawrence Weaver, Chairman
- ✓ (To be designated) Hammel, Green and Abrahamson
- ✓ Mr. Frank Digangi
- Mr. Phillip Harris
- ✓ Dr. Hugh Kabat
- ✓ Mr. Thomas Jones
- ✓ Dr. Robert Mulhausen
- ✓ Dr. Edna Fritz
- ✓ Dr. Lyle French
- ✓ Dr. Eugene Grim
- ✓ Dr. Norman Holte

FROM: ✓ Elmer W. Learn, Assistant to the President and University  
Planning Committee Assignment

SUBJECT: Planning Committee Assignment

As you know, we are moving rapidly toward definition of the health sciences development program in the form of preliminary schematics to be prepared by the Health Science architectural firms. It is essential that previous decisions relating to area relationships, special equipment and kind of space need be refined. These refinements must be documented with sufficient precision that the architects can proceed with the development of schematics.

In order to accomplish the above, we are asking you to serve as a special planning committee, chaired by Dr. Lawrence Weaver. Detailed questions will be brought to your attention by the architectural representative on the committee and the planning office staff. The realities of timing require a definitive report no later than March 1, 1968.



## COLLEGE OF PHARMACY COMMITTEE

Minutes of the Meeting February 8, 1968 (#1)

Present: Lawrence Weaver, Chairman; Bruce Abrahamson (Hammel, Green and Abrahamson), Dick Babcock (Hammel, Green and Abrahamson), Frank Digangi, Phillip Harris, Isabel Harris, Hugh Kabat, Thomas Jones, Phillip Portoghese, Edward Rippie, Taito Soine.

Relation of College of Pharmacy to other health science units and University departments - The first two years of the Pharmacy curriculum include elective courses which draw on all areas of the campus. The Pharmacy program involves work in the Basic Sciences in the area of anatomy, pharmacology, public health, microbiology, physiology and pathology. Although the graduate program has greater emphasis on laboratory work than classes, graduate courses relate to the biological sciences and the physics, economics and chemistry departments. Dean Weaver emphasized the increasingly important relationship between the College of Pharmacy and the Hospitals.

Classroom space - There is no provision for classroom space in the Pharmacy space projection. Mr. Abrahamson explained that it is important to determine not only the amount of space required for classes, but also the time the space will be in use. The Committee agreed that morning classes and afternoon labs would continue to be the most practical schedule. Consequently all classes should be able to meet at the same time during first, second, third and fourth hour periods. Classroom space must be adequate enough to accommodate lectures and the administration of examinations to classes of 150 to 170 students. In addition, facilities for combined classes, seating 300 students, will be required for occasional joint-class meetings. The Committee does not anticipate major changes in teaching patterns in the foreseeable future.

Laboratory space - Undergraduate laboratory space is included in the Pharmacy space estimate. Mr. Abrahamson inquired if it would be desirable to have lecture areas adjacent to laboratory facilities. Dr. Rippie felt a blackboard, visible from all points in the laboratory, would be adequate.

Library facilities - The Committee felt that the undergraduate Pharmacy library should be transferred to Diehl Hall. If study space could be provided for Pharmacy students in a non-library area, the additional load for Diehl would be somewhat alleviated. Dr. Soine noted that a skeleton library would still be required for the College of Pharmacy and graduate Pharmacy students would still need access to the chemistry, engineering and physics libraries.

Drug Information Center - The nucleus of a drug information system would have to be at the source of information--the library. However, part of the system should be located where questions originate, at some central point or points within the medical complex.

Clinical Pharmacy Program - Clinical Pharmacy requires new space located in the clinical setting of the Hospitals and not in the College of Pharmacy.

Relation of Pharmacy to health sciences services - Although the scientific apparatus shop services only the Hospitals now, there would be advantages to a centralized instrument repair area serving all the health science units. The Committee also recommended the centralization of data handling and animal holding areas. Similarly, there should be a main shop facility with only small, basic shops for each health science unit. Dr. Kabat felt a centralized audio-visual system would be too cumbersome to be practical. Pharmacy is considering hiring someone in the future to work with Pharmacy's audio-visual requirements. While classroom space for continuing education will be centralized, office space will be provided in the College of Pharmacy. Dr. Soine suggested that Medical Art and Photography should provide service for all the health science units.

Central stockroom and glassware washing - The Committee supported the proposal for central stockroom and glassware washing facilities. The area of the stockroom reserved for graduate students must have adequate ventilation. Solvent storage will not require a great deal of space but it will have to be conveniently located.

Drug manufacturing requirements - Although the extensive manufacture of drugs for the health sciences is not anticipated, there is area programmed in the Hospitals space request for assembling drugs. Hopefully these facilities will be used to provide clinical experience for 25-30 students six hours/week. Some additional space may be needed for Pharmacy laboratory adjacent to projected hospital space. This situation also exists for the sterile products laboratory.

Distilled water centralization - It will be possible to centralize distilled water facilities if each laboratory can be adequately supplied to more than one site within each laboratory.

Balance stations - A separate station for balances should be next to each laboratory. Several smaller balance rooms will probably be required for graduate laboratory areas.

Public parking - Pharmacy has no great demand for parking areas for the public. Ten such spaces would be sufficient.

Phasing possibilities - Mr. Abrahamson asked if it would be feasible to phase the transfer of the College of Pharmacy from existing to new facilities. Dean Weaver answered that while it would be possible to move the clinical program independently, the graduate and undergraduate programs share faculty and could not be successfully separated.

Instrument rooms - A central instrument room in the graduate laboratory area will be required for electronic equipment needing shielding and other large instruments used jointly. In addition there should be several smaller instrument rooms.

Animal laboratories - More Pharmacy animal laboratories are needed.

Student lockers and lounges - Students require individual lockers. Clinical Pharmacy students will need locker space in the Hospitals. The Committed recommended health sciences lounges instead of separate Dentistry, Medical School and Pharmacy facilities.

Radioisotope equipment - The use of radioisotopes is rapidly increasing. Laboratories involved with chemical synthesis will have to have facilities to handle it.

Joint laboratory facilities - The Committee agreed that it may be possible to share laboratories within Pharmacy to a limited extent, particularly for elementary work, if scheduling and equipment storage can be worked out. However, the sharing of laboratories with another health science unit would introduce essential administrative problems.

Faculty offices - The Committee recommended that faculty offices be adjacent to but separate from laboratory areas.

Special laboratories - Cold rooms, a sterile products laboratory and controlled environment facilities will be required. Mr. Jones noted that 700 sq. ft. control lab space has been allocated for Pharmacy use within the Hospitals.

## PHARMACY COMMITTEE

Minutes of the Meeting February 28, 1968 (#2)

Present: Lawrence Weaver, Chairman; Bruce Abrahamson, Richard Babcock, Frank Digangi, Phillip Harris, Thomas Jones, Jack Miller, Robert Mulhausen, Edward Rippie

Bruce Abrahamson requested clarification of the following areas:

Classroom Requirements: Two classrooms accommodating 150 students; two accommodating 250 students that can open into one room for 500 students; and one classroom each for the four divisions. These will be used concurrently.

Decentralized Storage: Stock rooms in and adjacent to laboratories are in addition to centralized storage and will hold supplies for the quarter.

Multi-use Laboratories: The Committee felt some labs built for Pharmacy could be used for the Basic Sciences on an interim basis but other labs, i.e., chemistry, could not be adaptable.

Animal Quarters: In addition to a large, central animal facility on the Minneapolis campus, there is need for one general animal area within the College of Pharmacy.

Greenhouse can be remote from labs.

Clinical Pharmacy: Components of the clinical pharmacy program that relate to the hospital will be located within the hospital, i.e., sterile room will be adjacent to the production room in the hospital.

Need for Pharmacy to be an Identifiable Entity: Dean Weaver indicated that it is not necessary for the College of Pharmacy to have a separate building. Mr. Rippie advocated having a well-defined area within the super-structure. The Committee agreed that the greatest problem with the super-structure concept is expansion. Mr. Digangi noted that with a self-contained unit it is possible to appeal directly to the administration for more space, whereas with a super-structure it becomes necessary to compete with other areas for space increases.

Teaching Laboratories: Dean Weaver recommended that labs not be tailored to specific courses but as general and adaptable as possible. Mr. Rippie mentioned that bench space per student is the critical factor in a teaching lab.

X-ray Unit: Mr. Harris recommended that consideration be given to a centralized experimental x-ray unit to be used by all divisions within the College of Pharmacy or possibly shared with other schools located within the complex.

Expansion: Mr. Abrahamson requested more information on the nature of projected expansion.

Office of the Dean

March 5, 1968

COLLEGE OF PHARMACY PLANNING COMMITTEE

The detailed space allocations are presented in Sections I through VIII on the attached sheets. This is followed by a summary. In most of the sections there is a vertical row of numbers on the left margin which refers to general relationship requirements given in Section IX.

These projections take precedence over those presented by individual departments on the Program Data Form. The information fulfills the requests of the architects, Messrs. Abrahamson and Babcock, except for classroom projections which will be handled by the College of Pharmacy representative on the Health Science committee concerned with this problem.

  
L. C. Weaver

LCW/alc

I. COLLEGE SHARED LABORATORIES AND ROOMS

	<u>1973</u>	<u>1986</u>
Interview, Conference, Seminar, Committee Room	400	400
Informal Study, Reading and Meeting Room (50 students)	800	800
Student Organization Room	250	250
Central Laboratory Supply Stock Rooms	1500	1750
Receiving, Shipping, Mail	250	250
Solvent Storage	100	100
Research Chemical and Equipment Storage Room	700	900
1) Cold Room (2)	180	180
2) Radioactivity Synthesis and Counting Rooms	500	750
3) Dark Room	120	120
4) Mechanical Work Shop	250	500
5) Instrument Repair Shop	200	450
6) Drug Information Center	800	2000
Typist-Steno Room	600	600
7) Audio-Visual	300	600
Student Locker Room Area	3000	4500
8) Instrument Room Central	900	1200
9) Animal Room Complex		
Animal Room (Rodents)	200	200
Animal Room (Dogs)	400	600
Animal Room (Cats, Rabbits, etc.)	200	200
Animal Room Cleaning Area	100	100
Animal Room Feed; Refuse Storage	100	100
Animal Room Surgery	180	180
Civil Service Locker and Lounge	200	300
Ladies Rest Room and Lounge	300	400
Rest Rooms, Plant Services, Services, Storage	1500	2000
Cafeteria - Lounge	1000	3000
Central Glassware Washing	258	468
	<u>15288</u>	<u>22898</u>

II. PHARMACOGNOSY

	<u>1973</u>	<u>1986</u>
Senior Faculty Office (and secretary ) (1-1)	250	250
Faculty Offices		
Teaching and Research (3-6)	390	780
Research (1-2)	130	260
Microscopic Pharmacognosy Suite		
Student Laboratory (75 students at a time)	3000	3000
Preparation Room	400	400
Satellite Stock Room	250	250
Greenhouse Complex		
General Purpose Growing Area	310	310
Individually Controlled Environmental Area	290	290
Plotting and Storage Area	400	400
1) Drug Processing Suite		
Drug Storage	200	200
Drying and Milling Area	200	200
Extraction Laboratory	120	120
Chromatographic and Partition Laboratory	400	800
Plant Tissue Culture Suite		
Plant Culture Room	400	400
Transfer Rooms (2) Sterile Air	240	240
Constant Temperature Laboratory	240	240
General Purpose Laboratory	240	240
Faculty Research Laboratories (4-8)	1000	2000
Post-Doctoral Office - Research Laboratories (4-6)	1000	1500
Four-man Research Laboratory - Graduate (2-4)	1600	3200
Eight-man Research Laboratory - Graduate (0-1)	--	1600
Pharmacognosy Conference Room	400	400
	<hr/>	<hr/>
	11460	17080

III. MEDICINAL CHEMISTRY

	<u>1973</u>	<u>1986</u>
Senior Faculty Office (and secretary) (1-1)	250	250
Faculty Offices		
Teaching and Research (8-12)	1040	1560
Research (2-4)	260	520
Medicinal Chemistry Laboratory Complex		
Student Laboratory (75 students at one time)	3000	3000
Balance Room	250	500
Chemistry Preparation Room	120	120
Satellite Stock Room	250	250
Instrument Laboratory	1200	3500
Hydrogenation Laboratory	240	240
Faculty Research Laboratory (10-16)	2500	4000
Post-Doctoral Office-Research Laboratories (4-6)	1000	1500
Eight-man Research Laboratories (3-4) Graduate	4800	6400
Four-man Research Laboratories (2-3) Graduate	1600	2400
Two-Man Research Laboratories (2-3) Graduate	800	1200
Medicinal Chemistry Conference Room	400	800
Reference and Reading Room (Chemistry Library)	500	1000
Instrument Room	500	1000
Research Technician (Faculty Laboratory Space)	--	1200
Special Preparation Room (Humidity, Temperature Control)	--	400
Chromatography Room (Humidity, Temperature Control)	--	400
Conference Seminar Room (Audio-Visual Controls)	--	1250
Organic Medicinal Products Laboratory	--	3500
Chemistry Preparation Room	--	240
Satellite Stock Room	--	240
	<hr/>	<hr/>
	18710	35470



IV. PHARMACEUTICS

	<u>1973</u>	<u>1986</u>
Senior Faculty Office (and secretary) (1-1)	250	250
Faculty Offices		
Teaching and Research (7-11)	910	1430
Research (2-4)	260	520
Dispensing Laboratory Suite		
Laboratory	3000	3000
Reference Room (Drug Information Contact)	120	120
Conference Offices (2)	240	240
Preparations Room	240	240
Satellite Stock Room	120	120
Drug Product Display and Study Area	300	300
Process and Preparation Laboratory		
Student Laboratory (75 students at one time)	3000	3000
Preparation Room	250	250
Satellite Stock Room	250	250
Biopharmaceutics/Physical Pharmacy Laboratory		
Student Laboratory (75 students at one time)	3000	6000
Preparation Room	250	500
Satellite Stock Room	120	240
1) Manufacturing Suite		
Office and Reference Area	260	260
Testing and Control Laboratory	400	600
Storage Room	250	400
Controlled Humidity Area	200	200
Drying Area	200	200
Tablet, Liquid and Ointment Preparation Area	400	400
Tablet Coating Room	120	120
Milling and Grinding Room	120	120
Parenteral Products Area (2)	400	600
Faculty Research Laboratories (8-15)	2000	3750
Post-Doctoral Office-Research Laboratories (4-6)	1000	1500
Twelve-man Study Laboratory -- First-year students	--	1400
Four-man Research Laboratory - Graduate (3-6)	2400	4800
Two-man Research Laboratory - Graduate (4)	1600	3200
Special Projects Laboratory (Hospital Pharmacy)	1000	2000
Pharmaceutics Conference Room	400	800
	<hr/>	<hr/>
	23060	36810

V. PHARMACY ADMINISTRATION

	<u>1973</u>	<u>1986</u>
Senior Faculty Office (and one secretary)	250	250
Faculty Offices		
Teaching and Research (2-4)	260	520
Research (1-2)	130	260
1) Pharmacy Administration Laboratory Suite		
Analysis and Calculating Laboratory	500	800
Reference Room	400	400
Student Laboratory (38 students at one time)	1500	3000
Graduate Suite (3-10)	1000	2500
Pharmacy Administration Conference Room	400	400
	<hr/>	<hr/>
	4440	8130

VI. CLINICAL PHARMACY \*

	<u>1973</u>	<u>1986</u>
1) Faculty Offices		
Teaching	130	390
Teaching and Service	390	780
2) Undergraduate Office-Laboratory (4)	500	3000
3) Clinical Pharmacy Conference Room	400	400
Hospital Pharmacy Graduate Laboratories (10-30)	800	1700
	<hr/>	<hr/>
	2220	6270

\*Includes Graduate Hospital Pharmacy

VII PHARMACOLOGY

	<u>1973</u>	<u>1986</u>
Faculty Offices		
Teaching and Research (4-4)	520	520
Research (1-1)	130	130
General Biology Undergraduate Laboratory	500	500
Faculty Research Laboratories	250	1250
	<hr/>	<hr/>
	1400	2400

VIII COLLEGE ADMINISTRATION

	<u>1973</u>	<u>1986</u>
Dean's Office	300	300
Secretary to the Dean	170	170
Secretary of the College	170	170
Associate Dean	200	400
Assistant to the Dean	200	200
Secretary	130	130
Clerk-Stenographers	500	500
Director, Continuing Pharmacy Education	400	400
Record Room	130	130
Conference Room	400	400
Business Office	400	800
	<hr/>	<hr/>
	3000	3600

SUMMARY - SPACE

	<u>1973</u>	<u>1986</u>
College Shared Laboratories and Rooms	15288	22898
Pharmacognosy	11460	17080
Medicinal Chemistry	18710	35470
Pharmaceutics	23060	36810
Pharmacy Administration	4440	8130
Clinical Pharmacy	2220	6270
Pharmacology	1400	2400
College Administration	3000	3600
	<hr/>	<hr/>
GRAND TOTAL:	79578	132658

IX. COMMENTS - GENERAL RELATIONSHIPS

I. College Shared Laboratories and Rooms:

- 1) Cold Room - should be in vicinity of graduate areas - all disciplines.
- 2) Same as 1).
- 3) Same as 1).
- 4) Can be anywhere in Health Science Center easily accessible to academic area.
- 5) Same as 4).
- 6) Must be in Library area (Note: we estimate need for 3000 sq.ft. to integrate Pharmacy Library into Health Science Library).
- 7) Same as 4) but strong need for more intimate contact -- perhaps some personnel in College.
- 8) Same as 1).
- 9) Should be adjacent to faculty research area in Pharmaceutics (Biopharmaceutics) but accessible to Medicinal Chemistry.

II. Pharmacognosy

- 1) Drug Processing Suite should be accessible to Medicinal Chemistry.

III. Medicinal Chemistry

IV. Pharmaceutics

- 1) Manufacturing Suite could be considered for integration into similar areas in the University Hospitals.

V. Pharmacy Administration

- 1) Represents an opportunity for innovation -- later.

VI. Clinical Pharmacy

- 1), 2), 3) All possible candidates for integration into University Hospitals areas.

VII. Pharmacology

Area should be adjacent to Biopharmaceutics.

VIII. College Administration

Bill: it would have been most desirable to have had a document such as this for Unit A.  
 Jay

Early PLANNING Program

12 April 1971

The following revision has incorporated the changes in the basic program requirements and their relationships to each other (as of 12 April), with the original program drawn up by The Architects Collaborative on 5 September 1968 (revised 4 October 1968).

At this point, the requirements of Equipment, Systems, and Personnel have not been re-evaluated and thus do not reflect the changes that may have taken place since 1968.

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REC'D 16 APRIL 71

NOTE: SHARED CLASSROOM SPACE OMITTED  
 2-150 SEAT AUDITORIUM @ 2711 = 5422

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### I. FUNCTION

The objectives of the College of Pharmacy are: 1) to educate men and women of ability, integrity, and character to identify, prepare, formulate, and distribute drugs and other health aids; 2) to develop in pharmacy students the essential knowledge, skills, and attitudes necessary for effective community practice and/or specialized institutional pharmacy practice; 3) to develop programs that recognize and encourage the team approach in the delivery of health services and the involvement of meaningful interprofessional relationships during the learning years; 4) to develop in the student an appreciation for and an interest in the various pharmaceutical research areas and to encourage original work and study by qualified persons who will make unselfish use of their services in the interest of health sciences; 5) to provide an environment conducive to the development of outstanding instructors and researchers; 6) to disseminate information about the uses and value of scientific medicine; 7) to win and deservedly keep public confidence and respect for the profession of pharmacy; 8) to aid the local, state, and federal governments in the control of habit-forming drugs and to enforce all laws for public welfare; 9) to assist public health agencies in the prevention and control of diseases and in the solution and management of other health problems; and 10) to provide and actively promote continuing education facilities for use by pharmacy and the allied health professions.

### II. ACTIVITIES:

Students are admitted to the four year professional course in the College of Pharmacy on the completion of one year of accredited collegiate work, or a three year professional course upon completion of a pre-Pharmacy year and the following courses: Basic Sciences, Physics, Organic Chemistry, and General Economics. Both courses lead to the degree of Bachelor of Science in Pharmacy. The PharmD program (six years) has been proposed and hopefully will be offered starting in the Fall career of 1971. This program would result in the professional degree of Doctor of Pharmacy.

Graduate study with major work in medicinal chemistry, pharmaceuticals, hospital pharmacy, pharmacognosy, and Pharmacy Administration, lead to the degrees of Master of Science (M.S.) and/or Doctor of Philosophy.

### III. RELATIONSHIP TO OTHER UNITS:

The College of Pharmacy relates to the Hospital Pharmacy in the applied clinical and research areas.

Pharmacy involves work in the Basic Sciences in the areas of Anatomy, Pharmacology, Microbiology, Physiology and Pathology and the clinical departments of the Medical School and the Schools of Public Health, Dentistry and Nursing.

Graduate courses relate to Biological Sciences, Physics, Economics and Chemistry Departments.

18 COLLEGE OF PHARMACY

III. RELATIONSHIP TO OTHER UNITS: (cont.)

Undergraduate students use Diehl Library. Graduate Pharmacy students need access to the Chemistry, Engineering and Physics Libraries, as well as Diehl Library.

Assuming the Medical Art Department, Instrument Repair, Data Handling and Audio-Visual Department are centrally located, Pharmacy would relate to this center.

Greenhouse facilities need to be reasonably available.

Minimal relation to the public.

Relation to parking - 20 stalls. One stall for each faculty person at each class period and 10 for the clinical pharmacists who will be "off campus."

IV PERSONNEL:

	<u>EXISTING 1971</u>		<u>1976</u>		<u>1986</u>	
	<u>ENTERING</u>	<u>TOTAL</u>	<u>ENTERING</u>	<u>TOTAL</u>	<u>ENTERING</u>	<u>TOTAL</u>
Undergraduate	100	300	125	400	150	560
Graduate						
Hospital Pharmacy		10		15		30
Medicinal Chemistry		20		35		50
Pharmaceutics		8		20		40
Pharmacognosy		3		7		12
Pharmacy Administration		0		3		10
TOTAL student Enrollment		341		480		702
Continuing Education		250		1,000		1,200
Faculty (Teaching & Research)						
Full time		30 (full & part time)		39		63
Part time				10		27
Civil Service						
Technical		5		15		25
Non-technical		9		19		27
TOTAL		44		83		142



18 COLLEGE OF PHARMACY

V. SUMMARY OF REQUIRED SPACES:

SPACE	EXISTING	1976	1986
Faculty Office		6,370	11,700
Faculty Research Laboratories*	3,095	12,740	23,400
Teaching Laboratories	10,045	11,524	17,286
Research	6,980	32,000	56,800
Administration	1,772	3,000	3,600
Support			
Teaching Service**	3,225	7,644	10,372
Instrument Repair, Photography	196	400	600
Audio-Visual	-	300	600
Data Handling	-	600	800
Locker Room, Student Lounge	1,439	3,000	4,500
Animal Rooms	353	1,000	2,000
Greenhouse Facility	3,643	1,000	1,000
<del>STAFF OFFICES</del>		1,412	
TOTAL	20,748	79,578	132,658

\*Existing space for office-laboratories.

\*\*Stockrooms, storage, and rest rooms.

Note: No library space projected.

VI. FUNCTIONAL DIVISION:

- 18.1 College shared laboratories and rooms <
- 18.2 Pharmacognosy
- 18.3 Medicinal Chemistry
- 18.4 Pharmaceutics
- 18.5 Pharmacy Administration
- 18.6 Clinical Pharmacy
- 18.7 Pharmacology -- DELETED
- 18.8 College Administration.

VII INTERNAL RELATIONSHIPS:

Graduate and undergraduate share faculty.

The three departments most deeply involved in research work should be as closely related physically as possible. These departments are Pharmaceutics, Medicinal Chemistry, and Pharmacognosy.

VIII. OTHER DESIGN CONSIDERATIONS:

Pharmacy does not see the phasing of their move. The entire School must move to the new setting at one time. The only possible exception would be that the clinical program could make a separate move.

18 COLLEGE OF PHARMACY 18.1 COLLEGE SHARED LABORATORIES AND ROOMS

I. FUNCTION:

Similar needs arose out of the departmental programs of the College of Pharmacy and have been grouped into this common use category. Facilities under this category will have to be scheduled by the different Pharmacy departments.

II. ACTIVITIES:

The demand on these facilities coming from all the Departments within the College of Pharmacy are varied in use and emphasis but generally it is of a teaching and/or research nature involving investigation, medication, application, and/or support.

III. RELATIONSHIP TO OTHER UNITS:

The facilities in total relate to all the Departments within the College of Pharmacy.

Conference, seminar and classrooms should relate to student traffic zones.

Central Laboratory Supply Stock Room and Research Chemical and Equipment Room must be serviced regularly. If on separate levels ready access between the two must be available, via elevator or dumbwaiter. The Research Chemical and Equipment Room should be in the area of heaviest graduate use, while it is desirable to have the Central Stock Room in a more direct relationship to the main service routes and the undergraduate areas.

Other relationships for individual functions are listed in the functional write-ups, which follow.

IV. PERSONNEL:

See section 18.0 (College of Pharmacy).

## V. SUMMARY OF REQUIRED SPACES (in square feet):

SPACE	AREA	NUMBER	1976 TOTAL	1986 TOTAL
Interview, Conference, Seminar, Committee Room	400	1	400	400
Informal Study, Reading and Meeting Room (50 students)	800	1	800	800
Student Organization Room	250	1	250	250
Central Laboratory Supply Stock Room	1500	1	1500	1750
a. Receiving, Shipping, Mail	250	1	250	250
b. Solvent Storage	100	1	100	100
Research Chemical and Equipment Storage Room	700	1	700	900
Cold Room (divided by 18.2, 18.3, and 18.4)	90	2	180	180
Radioactivity Synthesis	350	1	350	550
Radioactivity Counting Room	150	1	150	200
Dark Room	120	1	120	120
Mechanical Work Shop	250	1	250	500
Instrument Repair Shop	200	1	200	450
Drug Information Center	800	1	800	2000
Audio Visual	300	1	300	600
Student Locker Room Area	3000	1	3000	4500
Instrument Room Central	900	1	900	1200
Animal Room Complex				
a. Animal Room Surgery	180	1	180	180
b. Animal Room Cleaning and Equipment	180	1	180	180
c. Feed Storage	48	1	48	48
d. Refuse Storage	48	1	48	48
e. Receiving	96	1	96	96
f. Animal Room (Dogs)	240	1	240	480
g. Animal Room (Rabbits)	144	1	144	144
h. Animal Room (rats)	96	1	96	96
i. Animal Room (mice)	96	1	96	96
j. Isolation/Quarantine	96	1	96	96
k. Animal Room/Experimentation	96	1	96	96
Civil Service Locker/Lounge	350	1	350	500
Toilet and Lounge, Female	300	1	300	400
Toilets, Plant Services, Services, Storage	1500	1	1500	2000
Central Glassware Washing	258	1	258	468
Classrooms 2 @ 30 seats	450	2	900	1800
Support for classrooms or seminar rooms	200	1	200	400
Faculty Lounge/Conference	400	1	400	600
Vending Area	165	1	165	400
TOTALS			15,643	22,878

AUDITORIUM 2 @  
SUPPORT

5422

VI. FUNCTIONAL DIVISION:

INTERVIEW, CONFERENCE, SEMINAR, COMMITTEE ROOM

For use by students and staff for conferences, interviews, and seminars. Should be near College Administration offices, or in a heavy use area.

EQUIPMENT: table, chairs, chalkboard

SYSTEMS: telephone, intercom

PERSONNEL: 25

INFORMAL STUDY, READING AND MEETING ROOM:

For use by students and staff for informal study, reading, meetings, and classes (50 students). Locate near heavy student traffic area.

EQUIPMENT: table, chairs, chalkboard.

SYSTEMS: telephone, intercom

PERSONNEL: 50

STUDENT ORGANIZATION ROOM

Used by student organization within the College of Pharmacy as a headquarters for student contact and for planning and administrative work involved in running the organizations. At present, there are 5 such organizations.

EQUIPMENT: desks, tables, chairs, bulletin board, files.

SYSTEMS: telephone

PERSONNEL: 25

CENTRAL LABORATORY SUPPLY STOCK ROOMS

This area serves as the central bulk storage room for materials, supplies, and equipment used by the laboratories, and other facilities of the College of Pharmacy. Supplies will remain here until requisitioned. Should be in area of main service corridor.

EQUIPMENT: shelving, work counter, sink, storage and filing cabinets, typewriter, desk, refrigerator, access to hood on same floor--or within stock room itself.

SYSTEMS: intercom, telephone, 110V, cw, hw., dist. or deionized water.

PERSONNEL: 1-2

RECEIVING, SHIPPING, MAIL:

This area is the service point for the Central Laboratory Supply Stock Room. Here items are received, shipped, and mailed for the College of Pharmacy. Must be adjacent to Central Laboratory Supply Stock Room.

EQUIPMENT: hand cars, shelving, counters.

SYSTEMS: conveyance, telephone, intercom.

PERSONNEL: 1-2

SOLVENT STORAGE

Alcohol and other volatile liquids are stored here in drums. Pouring and packaging of volatile liquids is performed. The room must be constructed and vented to meet applicable requirements for hazardous areas and should be adjacent to Central Laboratory Supply. Slope floor to drain and at entry door provide curb with ramp. Locate for least temperature change. In addition plans should be made for individual storage areas on each level of the building that will be using these solvents. When not in use by the students or researchers, all solvents will be kept in these rooms as a safety precaution.

EQUIPMENT: barrel racks, work counters, shelving.

SYSTEMS: special venting.

PERSONNEL: 1

RESEARCH CHEMICAL AND EQUIPMENT STORAGE ROOM

Chemicals and equipment used in Pharmacy research will be stored here until requisitioned. This room should be in the Grad-staff area. Direct access to the Central Laboratory Supply Stock Room must be maintained, either by service elevator or dumbwaiter.

EQUIPMENT: shelving, work counter, sink, filing and storage cabinets, desk, typewriter, drying racks, refrigerator.

SYSTEMS: intercom, telephone, 110V, hw, cw, dist. or deion. water.

PERSONNEL: 1-2

COLD ROOM

The 180 sq. ft. allocated for shared cold rooms has been divided equally by the three major research areas, as each area felt that they will be needing ready access to the cold rooms for their work. Therefore 60 sq. ft. each was given to 18.2, 18.3 and 18.4. These departments will then add to this area from their own previous allotment of space to attain room size which will meet their needs.

RADIOACTIVITY SYNTHESIS ROOM:

This room is used for the chemical synthesis of radioactive compounds and the handling of biological materials containing radioactive substances. Growing of plants inside the chamber with a vented hood is essential. Within the synthesis room a small room which could be used as a dark room would be desirable. This would be taken from the 350 sq. ft. allotted this room, and could be used for general synthesis procedures when not required for use as a dark room.

EQUIPMENT: special hoods, benches, S.S. sink, chalkboard, lead shields, radio-isotope storage, shelving.

SYSTEMS: hw, cw, dist. water, vacuum, air, steam, 110v, 220v.

PERSONNEL: 3-4

RADIOACTIVITY COUNTING ROOM:

Used for radioactivity counting and recording purposes. Should be physically

RADIOACTIVITY COUNTING ROOM: (cont.)

separated from the radioactivity synthesis room (preferably across the hall or several doors away) to avoid possible contamination.

EQUIPMENT: benches, chalkboard, counters, chairs, shelving.

SYSTEMS: 110v, 220v.

PERSONNEL: 2-3

DARK ROOM

For use mainly in audio-visual productions, as well as for some research.

Should be adjacent to the audio-visual room.

EQUIPMENT: table, chairs, special lights, photo dryer, sink, developing tanks, shelving

SYSTEMS: hw, cw, gas, 110v.

PERSONNEL: 2

MECHANICAL WORK SHOP AND INSTRUMENT REPAIR SHOP

Should be adjacent to Central Laboratory Supply Stock Room. Direct access to service elevator. Should have available all services that are supplied to the individual laboratories, so that they might be used in checking the instrument operation from a mechanical standpoint. Need availability of fume hood, either on same floor or in shop if necessary.

EQUIPMENT: drill press, lathes, grinder, vice, work benches, shelving, chairs, sink, hood (near-by).

SYSTEMS: air, vacuum, gas, 110v, 220v, dist. or deion. water, steam, telephone

PERSONNEL: 1

DRUG INFORMATION CENTER:

Information center for investigation and dissemination of drug information.

A student study area for use of data processing or reference journals.

Main use by undergraduates. Possibility of eventual tie-up with biomedical library if space is needed to provide a Drug Information Service to the Health professions and the public in general. Should be located in area of heavy student use.

EQUIPMENT: tables, chairs, shelving, and index.

SYSTEMS: telephone, data processing

PERSONNEL: 25

AUDIO-VISUAL

Provides storage for audio-visual equipment used by students and staff. Also for small scale productions. Should be adjacent to dark room.

EQUIPMENT: audio-visual equipment, carts, shelving, work counter.

SYSTEMS: telephone.

PERSONNEL: 1-2

STUDENT LOCKER ROOM

Students require individual lockers. Clinical pharmacy students will need locker space in the Hospitals.

EQUIPMENT: 500 lockers, some chairs.

SYSTEMS: intercom

PERSONNEL: 500

CENTRAL INSTRUMENT ROOM

This room provides a controlled environment for major instrumentation routinely used by Pharmacognosy, Pharmaceutics, and Medicinal Chemistry. The NMR spectrometer should be housed in a separate (8' x 8') properly shielded room adjacent to or within the central instrument room. Other instrumentation may likewise need to be properly shielded, and the feasibility of shielding the entire room should be looked into. Humidity and temperature control very important to proper functioning of much of the equipment.

EQUIPMENT: misc. spectrometers, polarimeters, g.c., centrifuge, sink, benches, shelves, cabinets, desk.

SYSTEMS: air, vacuum, hw., cw, dist. or deion. water, 110v, 220v, intercom, telephone

PERSONNEL: 5-10

ANIMAL ROOM COMPLEX

- a. Animal Room Surgery -- large and small animal surgery and experimentation.

EQUIPMENT: surgery table, 2 surgery lamps-overhead, table, shelving, s.s. sink

SYSTEMS: hw, cw, dist. or deion. water, u.v. system, telephone, gas, vacuum, steam, 110v, 220v.

PERSONNEL: 2-3

- b. Animal Room Cleaning and Equipment -- This room is used for the cleaning of the animal cages and standards. Hodling cage size 24" x 24" x 30" is common, although larger ones (48" x 36" x 36") may be used at times.

EQUIPMENT: pass through autoclave -- steam or ethylene oxide, sink (double), counters, shelving, chair.

SYSTEMS: UV, hw, cw, steam, gas, vacuum, compressed air, 110v, 220v, dist. or deion water, telephone

PERSONNEL: 1-2

- c. Feed Storage -- Used for the preparation of animal food. Food bins should be insect proof. Close to service elevators.

EQUIPMENT: sink, shelving, storage bins.

SYSTEMS: hw, cw, steam, gas, vacuum, 110v

PERSONNEL: 1

- d. Refuse Storage: Used for storage of all refuse. Should be physically separated from food storage.

EQUIPMENT: sink, refuse storage bins, shelving.

SYSTEMS: hw, cw, 110v.

PERSONNEL: 1

STUDENT LOCKER ROOM

Students require individual lockers. Clinical pharmacy students will need locker space in the Hospitals.

EQUIPMENT: 500 lockers, some chairs.

SYSTEMS: intercom

PERSONNEL: 500

CENTRAL INSTRUMENT ROOM

This room provides a controlled environment for major instrumentation routinely used by Pharmacognosy, Pharmaceuticals, and Medicinal Chemistry. The NMR spectrometer should be housed in a separate (8' x 8') properly shielded room adjacent to or within the central instrument room. Other instrumentation may likewise need to be properly shielded, and the feasibility of shielding the entire room should be looked into. Humidity and temperature control very important to proper functioning of much of the equipment.

EQUIPMENT: misc. spectrometers, polarimeters, g.c., centrifuge, sink, benches, shelves, cabinets, desk.

SYSTEMS: air, vacuum, hw., cw, dist. or deion. water, 110v, 220v, intercom, telephone

PERSONNEL: 5-10

ANIMAL ROOM COMPLEX

- a. Animal Room Surgery -- large and small animal surgery and experimentation.

EQUIPMENT: surgery table, 2 surgery lamps-overhead, table, shelving, s.s. sink

SYSTEMS: hw, cw, dist. or deion. water, u.v. system, telephone, gas, vacuum, steam, 110v, 220v.

PERSONNEL: 2-3

- b. Animal Room Cleaning and Equipment -- This room is used for the cleaning of the animal cages and standards. Hoiling cage size 24" x 24" x 30" is common, although larger ones (48" x 36" x 36") may be used at times.

EQUIPMENT: pass through autoclave -- steam or ethylene oxide, sink (double), counters, shelving, chair.

SYSTEMS: UV, hw, cw, steam, gas, vacuum, compressed air, 110v, 220v, dist. or deion water, telephone

PERSONNEL: 1-2

- c. Feed Storage -- Used for the preparation of animal food. Food bins should be insect proof. Close to service elevators.

EQUIPMENT: sink, shelving, storage bins.

SYSTEMS: hw, cw, steam, gas, vacuum, 110v

PERSONNEL: 1

- d. Refuse Storage: Used for storage of all refuse. Should be physically separated from food storage.

EQUIPMENT: sink, refuse storage bins, shelving.

SYSTEMS: hw, cw, 110v.

PERSONNEL: 1



- e. through k. Animal Rooms -- Animals will be housed on movable stands. These are holding and experiment areas. Each species of animal used, should have its own quarters. Isolation facility needed in case of disease outbreak. Individual access to each of the rooms -- central corridor suggested, with rooms branching off of the corridor.
- EQUIPMENT: cages, shelving, racks for cages.  
SYSTEMS: hw, cw, ll0v, intercom, steam, UV  
PERSONNEL: 1

The following concepts should be kept in mind with regards to the animal facilities:

- (1) The entire complex should be under negative pressure.
- (2) Isolation of noise and odors produced in complex should be maximized.
- (3) Walls and floors must be waterproof.
- (4) Suspended ceilings not good (nor are exposed overhead pipes) because of harboring of vermin, disease organisms, and odors. A plastered ceiling, painted with an emulsion paint which allows "breathing" and prevents water condensation, would be best.
- (5) Corridors and applicable doors must be wide enough to accommodate largest cages (for 30 dg. dog - 48" x 36" x 36".)
- (6) A clear access is needed for movement of these large cages to the cage washer in the research animal hospital adjacent to unit B/C (under Mayo).
- (7) U.S. Department of Health, Education, and Welfare suggests a minimal door size of 42" wide and 84" high.
- (8) If fully air-conditioned, there should be no re-circulation of room air.
- (9) Room temperatures should be kept within a range of 18° to 26° C (65° to 80° F). If the suitable temperature within this range is established, a stability with tolerance of ± 3° is required.
- (10) The air-handling capacity should allow 8 to 12 air changes per hour.
- (11) Relative humidity should be kept at 50% ± 10%.
- (12) The entire system should permit individual control and adjustment of each animal room. This includes control of lighting.
- (13) The animal facility and human occupancy areas should be ventilated separately.
- (14) Provision should be made for emergency lighting and power in the event of a power failure.
- (15) Food storage areas should be physically separated from refuse areas.
- (16) Autoclave in area recommended (in Cleaning/Equip. room). For use in sterilization of small cages, operating instruments, etc.
- (17) Each species should be housed separately. One animal room should not open directly into another one (except for emergency requirements.) The use of a central corridor is suggested.
- (18) Best if drainage system for animal quarters is separate from that of remainder of building.
- (19) Floor drains in all rooms.
  - (a) Drainpipes not less than 4 inches in diameter.
  - (b) Minimum pitch of floors is 1/4 inch per foot.

CIVIL SERVICE LOCKER AND LOUNGE

EQUIPMENT: lockers, couches, chairs, tables,  
SYSTEMS: telephone, punchclock, 110v  
PERSONNEL: approximately 30

TOILET AND LOUNGE, FEMALE

EQUIPMENT: water closets, lavatories, chairs, mirrors  
SYSTEMS: hw, cw, 110 v

TOILETS, PLANT SERVICES, SERVICES, STORAGE

General procedures.

CENTRAL GLASS WASHING

Glassware will be picked up from the various departments' research areas washed and dried in this area and then returned to the respective laboratories on a daily basis. Should be located with ready access to central supply.

EQUIPMENT: shelving, table chairs, dishwahser, sinks, drying racks, ovens, cabinets.

SYSTEMS: hw, cw, dist. or deion. water, 110v, 220v.

PERSONNEL: 1-2

CLASSROOMS:

In addition to the 5,422 sq. ft. allocated to Unit F for shared classroom (2 classrooms @ 150 seats) facilities, Pharmacy will need several smaller classrooms available for smaller groups. Needed will be two classrooms at 30 seats each, being able to be converted into one larger classroom at 60 seats. Fifteen sq. ft. is allocated per seat or 900 sq. ft. total will be needed. An additional 200 sq. ft. is allocated for support space if needed, and if not necessary should be used for seminar room space. Audio-visual facilities needed.

FACULTY LOUNGE/CONFERENCE AREA:

Primarily used as a lounge, but easily adaptable to use as a conference area. Limited kitchen facilities should be made available. Should be in general area of College Administration (18.8) or on upper level if that is not possible.

EQUIPMENT: chairs, couches, tables, shelving, kitchen facilities

SYSTEMS: 110v, 220v, hw, cw, telephone

PERSONNEL: 10-20

VENDING AREA:

Limited area for vending services. Should be on heavy traffic level, e.g. near student locker facilities.

VII. Internal Relationships

The necessary internal relationships have been outlined in the previous functional descriptions.

**I. FUNCTION:**

The function of the Pharmacognosy Department is to educate undergraduate and graduate students in that branch of Pharmacy which deals with the biological, biochemical, and economic features of natural drugs and their constituents from plants, microorganisms, and animals. Pharmacognosy is an application of chemistry, microbiology, and botany to the discovery of new drugs from nature.

**II. ACTIVITIES:**

Through lectures and laboratory work students are instructed in the discovery, isolation, production, and application of natural drugs. The facilities required to grow microorganisms are essential to this discipline. Graduate students and faculty participate in research functions.

**III. RELATIONSHIP TO OTHER UNITS:**

Undergraduate and graduate instruction relates to the Pharmacy library, and to the following departments in order of their interaction; Microbiology, Biochemistry, Chemistry, Pharmacology, Medicinal Chemistry, Botany, Zoology, Medicinal Plant Garden.

Relation to the Public involves: inquiries on natural products (antibiotics, hormones etc.), poisonous plants, and drug plants, by Health officers; exhibits for herb clubs; assistance to public schools in special projects.

Relates to all Health Science units in preparation of crude and refined drugs for their use and also for physicians upon demand.

Medicinal Chemistry occasionally uses the greenhouse. Graduate students and staff of the Pharmacognosy Department use the Radioactive Suite, the Cold Rooms, and Glasswashing Facilities under college shared rooms.

**IV. PERSONNEL:**

	1971	1976
TOTAL		
Graduate (incl. Post. Doc.)	2	15
Staff	2	4
Secretary	0	1
Clerical (non-tech)	2	3
Technicians	3	

## V. SUMMARY OF REQUIRED SPACES (sq. ft.):

SPACE	AREA	NUMBER	1976 TOTAL	1986 TOTAL
Senior Faculty Office	250	1	250	250
Staff Teaching & Research Offices	130	4	520	1040
Pharmacognosy Student Laboratory	3000	1	3000	3000
Preparation Room	400	1	400	400
Satellite Stock Room	250	1	250	250
General Purpose Growing Area Environmentally Controlled	400	1	400	400
Plant Room	200	1	200	200
Potting and Storage Area	310	1	310	310
Drug Storage	200	1	200	200
Drying and Milling Area	200	1	200	200
Extraction Laboratory	120	1	120	120
Chromatographic and Partition Laboratory	300	1	300	700
Fermentation Laboratory	400	1	400	400
Sterile Transfer Rooms	50	3	150	150
Constant Temperature Laboratory	330	1	330	330
General Purpose Laboratory	340	1	340	340
Research Laboratories (Post-Doc)	225	4	900	1800
Conference Room	400	1	400	400
Instrument Room	300	1	300	600
8-Man Graduate Research Lab	1400	1	1400	2800
Secretary	150	1	150	150
Faculty Research Laboratories	250	4	1000	2000
Cold Room (with 60 sq. ft. -18.1)	90	1	90	90
TOTALS			11,610	16,130

## VI. FUNCTIONAL DIVISION:

SENIOR FACULTY OFFICE

Office and clerical space is provided for the Head of the Department of Pharmacognosy to conduct administrative and teaching procedures.

EQUIPMENT: desks, chairs, table bookcases, files, bulletin board, dictating equipment

SYSTEMS: telephone, intercom

PERSONNEL: 1 Faculty

STAFF TEACHING AND RESEARCH OFFICE

Office space is provided for staff to prepare for teaching and research functions. These offices should be clustered together, with direct access to the 8-man graduate laboratory because the Faculty use the grad lab as their own lab. Each staff member has 3-4 graduate students under his jurisdiction.

STAFF TEACHING AND RESEARCH OFFICE (cont.)

EQUIPMENT: chairs, wall storage, library tables, magazine racks, bulletin board  
SYSTEMS: telephone  
PERSONNEL: 1 Staff/office

PHARMACOGNOSY STUDENT LABORATORY

This is the undergraduate lecture, demonstration and laboratory space for Pharmacognosy. Lab periods run for 4-5 hours. Effective pre-lab discussions (approx. 30 minutes in length) must be given to all the students prior to the laboratory work. Films (16 mm.) and slides (35 mm.) are also shown during the laboratory. Closed circuit television is also desired. Exhibit space for plants, crude drugs, charts, molds, and photos is required. A separate area where prelab discussion and film and other presentations can be made is desired.

Students must be able to perform either microscopy or chemical extractions at the laboratory table. The student will require adjustable seats and leg room in the units. Laboratory bench space of 4' x 2' per student and bench storage for lab books, glassware, and microscopes is required.

Laboratory preferably has north or east light. Hood space for 20 students, a centrally located instrument and supply table and a safety station are required. Ring stand units should be built into lab benches.

EQUIPMENT: High laboratory benches, fume hoods, refrigerator, 5°-50°C incubator, centrifuges, PH meters, spectrometers, chromatography jars, extractors, sinks, storage for chemicals, solvents, and drugs, chalkboard, movie screen  
SYSTEMS: Steam, vacuum, gas, telephone, distilled or deionized water, air, 110V, 220V (benches and hoods)  
PERSONNEL: 75 students, 2 instructors, 2 assistants

PREPARATION ROOM

This space is used by the instructor(s) and his assistant(s) to prepare for class lectures, demonstrations, and material for class use (slides), and should have direct access to the Pharmacognosy Lab, the Satellite Stock Room, and the 8-man graduate research lab. This room also serves as the control point from which equipment and supplies are issued to the students.

EQUIPMENT: Bench area, storage, sink, hood  
SYSTEMS: Distilled or deionized water, steam, vacuum, gas, air, 110V, 220V.  
PERSONNEL: 1 instructor, 2 assistants

SATELLITE STOCK ROOM

This room stores supplies, equipment, drugs, etc., for use in the Pharmacognosy Lab. It is serviced by the Central Laboratory Supply Stock Room. This room should not have window exposure or accumulate heat.

EQUIPMENT: Adjustable shelving--glass enclosed, bench area  
SYSTEMS: 110V  
PERSONNEL: 1-2

GENERAL PURPOSE GROWING AREA

This area is for growing plants and herbs to be used in Pharmacognosy research and instruction. Location with regard to natural light important. Natural light is desired, but the heat that it produces is not; thus temperature control provisions are necessary. In conjunction with this an alarm system is desired to check temperature range. Benches with Redwood sides, a corrugated metal bottom that gravel is placed upon is desired for growing facilities. Insect infestation is a problem. Access from both ends of the greenhouse is desired.

EQUIPMENT: 3 benches, floor drains, water evaporator unit  
SYSTEMS: temperature controlled vanes; heat, steam, water, air, 110V, 220V.  
PERSONNEL: 2 civil service employees

ENVIRONMENTAL CONTROLLED PLANT ROOM

This room should be located adjacent to the Post-Doctoral Research Laboratory and is used for the environmental control of plant growth. A movable light bank on a control timer with a 4,000-foot candle power range is needed.

EQUIPMENT: Benches, sink  
SYSTEMS: Light control 300-4,000 F.C. Temperature control  $20^{\circ}-40^{\circ}\text{C} \pm 2^{\circ}$ ,  
110V, 220V, air, vacuum, steam, gas  
PERSONNEL: 1 assistant

POTTING AND STORAGE AREA

This room is used for potting the various plants. Work space is also needed for plant preparation. Storage is for pots, records, soil materials, and maintenance items. Access to freight elevator is desired.

EQUIPMENT: Storage cabinets, sink, autoclave, insecticide cabinets, pot and  
soil storage bins  
SYSTEMS: Steam, gas, air, 110V, 220V.  
PERSONNEL: 2 assistants

DRUG STORAGE

This room is used for storing drugs in a semi-bulk form as they are packaged from the extraction laboratory. The crude drugs and purified substances stored here are supplied to Medicinal Chemistry, Pharmacology, and Pharmaceutics Departments. Solvents from the extraction lab are also stored here.

EQUIPMENT: Shelving, pharmaceutical storage cabinets.  
SYSTEMS: Temperature and humidity control.  
PERSONNEL: 1

DRYING AND MILLING AREA

This room is used for the drying and milling of plants into a form from which their natural drug constituents can be extracted. This room should be located adjacent, and have access to the Extraction Laboratory.

EQUIPMENT: Drying trays and racks  
SYSTEMS: Steam, sink, gas, circulating hot air ovens 25°-40°C, 110V, 220V,  
air, vacuum, Wiley mills  
PERSONNEL: 1

EXTRACTION LABORATORY

Plant growth coming from the Drying and Milling Room undergoes different laboratory procedures depending on the species and variety before the natural drugs or purified substances can be extracted.

EQUIPMENT: Lab benches, sink  
SYSTEMS: Steam, vacuum, gas, distilled water, air, 110V, 220V, telephone  
PERSONNEL: 1-2

CHROMATOGRAPHIC AND PARTITION LABORATORY

Different types of chromatographic processes using various sized chromatographic jars and systems are carried out in this room. Direct access to the 8-man Graduate Research Lab and the Pharmacognosy Student Lab is essential.

EQUIPMENT: Tables, storage, hood for chromatographic spraying (caustic), sink  
SYSTEMS: Distilled or deionized water, vacuum, gas, air, 110V, 220V, temperature control 5°-25°C ± 2, humidity control.  
PERSONNEL: 1 instructor, 1 assistant

FERMENTATION LABORATORY

The Fermentation Laboratory is used to cultivate microorganisms from plant constituents. This is an environmental controlled room, 20°-40°C ± 2°C. Direct access to the 8-man Graduate Research Lab and the Pharmacognosy Student Lab is essential.

EQUIPMENT: 3 shakers, incubator-shaker, fermentor, light bank 300 - 3,000 F.C.  
over shaker, sink  
SYSTEMS: Ultraviolet lights air purification, steam, gas, air, 110V, 220V.  
PERSONNEL: 1-2

STERILE TRANSFER ROOMS

To consist of three separate sterile rooms each 50 square feet with a constant temperature capability of 20-40 degrees C ± 2 degrees C. One unit will have an intermediate size autoclave (20" x 20" x 36" -- double door) which can be filled from the Constant Temperature Laboratory. All units will require positive pressure and will be located in the Constant Temperature Laboratory. The units will be operational continuously (24 hours per day). Provisions should be made for perforated raised floors and ceiling working area for the three units.



EQUIPMENT: S.S. sink, work table, UV lights  
SYSTEMS: Distilled or deionized water, steam, vacuum, gas, air, 110V, 220V.  
PERSONNEL: 1 instructor per unit

CONSTANT TEMPERATURE LABORATORY

This is an environmentally controlled room (20-40 degrees C  $\pm$  2), positive pressure, and has within it 2 small rooms 6' x 6' for fluorescent microscopy and tissue examination. This laboratory should have direct access to the sterile transfer rooms and be adjacent to the General Purpose Laboratory. The Constant Temperature Laboratory and the Sterile Transfer Rooms together must have a temperature regulation and filtration system separate from those of others in the building.

EQUIPMENT: Storage, benches, s.s. sink, chair, walk-in incubator temperature 5-40 degrees C  $\pm$  1 degree.  
SYSTEMS: Distilled or deionized water, vacuum, air, steam, gas, 110V, 220V.  
PERSONNEL: 1-2

GENERAL PURPOSE LABORATORY

This laboratory is to be adjacent to the above two units, and will provide facilities for tissue culture glassware storage, media preparation, and sterilization (large 24" x 36" x 60" chamber autoclave and 20" x 20" x 36" ethylene oxide sterilizer). It is assumed that dishwashing with distilled water rinsing, and drying will be done in another area of the building. If this statement is not correct, provisions should also be made here for dishwashing and drying.

EQUIPMENT: Double-glass water still, large roll in autoclave, S.S. sinks, counters, shelving  
SYSTEMS: Steam, gas, vacuum, air, 110V, 220V  
PERSONNEL: 1-2

RESEARCH LABORATORIES (Post-Doctoral)

Pharmacognosy research procedures of varying degree of complexity are performed in these rooms. An isolated area for instruments and balances is desired (see Instrument Room).

EQUIPMENT: Research counters, shelving, desks, chairs, refrigerator, centrifuges, lyophyllizer, chemical hoods, deep freeze refrigerator, gas chromatography, storage.  
SYSTEMS: Air, gas, steam, vacuum, distilled or deionized water, 110V, 220V, telephone  
PERSONNEL: One per room if individual rooms; 4 to 8 individuals if large common facility.

CONFERENCE ROOM

This room is used by students and staff of the Pharmacognosy Department for conferences and seminars.

EQUIPMENT: Conference table, chairs, chalkboard, movie screen  
SYSTEMS: Telephone, intercom, 110V  
PERSONNEL: 25 people

INSTRUMENT ROOM

Departmental instrument room to be shared by graduate students, faculty, undergraduate students and post-doctorates. Should be adjacent to the 8-man graduate laboratory, faculty offices, and the post-doctoral laboratory. This instrument room should contain positive air pressure, and it should have sliding glass doors. This is to provide protection of these instruments.

EQUIPMENT: Counters, chairs, shelving, various instruments.  
SYSTEMS: Gas, air, vacuum, 110V, 220V, temperature and humidity control.  
PERSONNEL: 4-8

8-MAN GRADUATE RESEARCH LABORATORY

This laboratory space is used by 4 faculty members and the 8 graduate students who are under their jurisdiction. The staff research offices should be directly accessible from this facility. Each lab bench will be shared by 2 graduate students and will also have 2 lower desk units. Two hoods are required. Direct access to the Chromatographic and Partition Laboratory, the Fermentation Laboratory, the Preparation Room and Satellite Stock Room is required.

EQUIPMENT: Bulletin Board, laboratory benches, chairs, refrigerators, storage  
SYSTEMS: Air, gas, steam, vacuum, distilled or deionized water, 110V, 220V,  
telephone  
PERSONNEL: 8 graduate students, 4 faculty

SECRETARY

Space is provided for clerical functions of the department. It should be located adjacent to the Senior Faculty Office and the Conference Room and have control of scheduling appointments and usage of both rooms.

EQUIPMENT: Desk, chairs, typewriter, dictating and duplicating equipment.  
SYSTEMS: Telephone, intercom, 110V.  
PERSONNEL: 1 secretary.

FACULTY RESEARCH LABORATORIES

Pharmacognosy research procedures of varying degree of complexity are performed in these rooms by the faculty in the department.

EQUIPMENT: Research benches, shelving, hoods, refrigerator-freezers, storage, various instruments depending upon need.

SYSTEMS: Air, gas, steam, vacuum, distilled or deionized water, 110V, 220V, telephone

PERSONNEL: 1 faculty member.

#### COLD ROOM

This is an environmentally controlled room of 2-5 degrees C. It should be directly accessible from the Post-Doctoral Research Laboratory.

EQUIPMENT: Bench space, centrifuges

SYSTEMS: 110V, 220V, vacuum, water

PERSONNEL: 2-4

#### VII. INTERNAL RELATIONSHIPS

The Chromatographic and Partition Laboratory, the Fermentation Laboratory, the Preparation Room and the Satellite Stock Room serve both the Pharmacognosy Student Laboratory and the 8-Man Graduate Research Laboratory.

The Environmentally Controlled Plant Room and the Cold Room relate directly to the Post-Doctoral Research Laboratory.

The Constant Temperature Laboratory should be adjacent to the General Purpose Laboratory in order to share the pass through autoclave.

The Drying and Milling area relates to the Drug Storage area and the Extraction Laboratory. This grouping as a whole can be located adjacent to the General Purpose Growing Area or near the Post-Doctoral Research Laboratory.

It is essential that the Pharmacognosy Department be located near the basic pharmacy health sciences and close to certain shared laboratories; in order of priority: isotope rooms, instrument rooms, cold room, dark room, drug information center, animal room complex, central glassware washing.

#### VIII. OTHER DESIGN CONSIDERATIONS:

Sterile air (rid of oil) all outlets for Graduate Research.

Built in ring tops on all work benches.

Closed circuit television and other audio-visual aids are required.

## I FUNCTION:

The function of the Medicinal Chemistry Department is to educate undergraduate and graduate students in the application of the principles of chemistry to therapeutic usage of a wide range of chemical entities. A further function in the graduate area is to study the design, synthesis, and mechanism of action of medicinal agents. The faculty in addition to visiting scientists, pre and post doctoral students are engaged in original chemical and biological research related to medicinal chemistry.

## II ACTIVITIES:

Student instruction is by means of lectures and laboratory work. Faculty, pre and post doctoral students besides teaching are engaged in chemical and biological laboratory research.

## III RELATIONSHIP TO OTHER UNITS:

Medicinal Chemistry consistently works with Pharmacology, Biochemistry, Chemistry, Pharmaceutics, Pharmacognosy, Clinical Medicine, and Botany.

There is no relationship to the public.

## IV PERSONNEL:

TOTAL	<u>1971</u>	<u>1976</u>
Graduate	20	35
Staff	6	9 + 2 Part time
Students (teaching assistants)	5	8
Clerical	1	2
Technicians	1	3

## V SUMMARY OF REQUIRED SPACES:

SPACE	AREA	NUMBER	1976 TOTAL	1986 TOTAL
Senior Faculty Office	250	1	250	250
Faculty Offices				
Teaching and Research	130	8	1040	1560
Research	130	2	260	520
Medicinal Chemistry Lab Complex				
Student Laboratory	3000	1	3000	3000
Balance Room	250	1	250	500
Chemistry Prep. Room	120	1	120	120
Satellite Stock Room	250	1	250	250
Instrument Laboratory	1200	1	1200	3500
Hydrogenation Laboratory	240	1	240	240
Faculty Research Laboratory	250	10	2500	4000
Post-doctoral Office/Research	250	3	750	1500
Eight-man Graduate Research Labs	1560	3	4680	6240
Four-man Graduate Research Labs	800	2	1600	2400
Two-man Graduate Research Labs	400	2	800	1200
Conference/Reference/Reading Room	500	1	500	1000
Instrument Room	500	1	500	1000
Chromatography Room	400	1	400	400
Cold Room (+ 60 sq.ft. - 18.1)	120	1	120	120
Biological Processes Laboratory	250	1	250	500
Secretary	150	1	150	150
Research Technician (Faculty)	200	6	---	1200
Special Preparation Room	400	1	---	400
Conference Seminar Room	1250	1	---	1250
Organic Medicinal Products Lab	3500	1	---	3500
Chemistry Prep. Room	240	1	---	240
Satellite Stock Room	240	1	---	240
TOTALS			18,860	35,280

## VI FUNCTIONAL DIVISION:

SECRETARY (DEPARTMENTAL OFFICE)

This space houses graduate records and performs duplicating and general secretarial services for the Medicinal Chemistry department. The secretary should have control of access to the conference room and the department head's office.

EQUIPMENT: Chairs, desk, files, shelving, duplication equipment, typewriters.  
 SYSTEMS: Telephone, intercom  
 PERSONNEL: 2 secretaries

EQUIPMENT: Standard lab benches with all facilities including additional 110V, 220V outlets, blackboard, raised lecture platform, assorted instruments.  
SYSTEMS: Intercom, closed circuit TV  
PERSONNEL: 1 instructor, 3 assistants

#### HYDROGENATION LABORATORY

This space will be used for somewhat hazardous work such as hydrogenation, ozonation, vacuum distillations. Blowout wall and floor drain desired. Environmental control for low humidity and temperature necessary. This room is used by graduate students and faculty and should be located in the graduate area.

EQUIPMENT: Hood, hydrogenation equipment, ozonator, lab bench, vacuum distillation equipment  
SYSTEMS: Steam, vacuum, gas, hot water, air, 110V, 220V, sink, cold water, distilled or deionized water, intercom  
PERSONNEL: Graduate students and staff

#### SATELLITE STOCKROOM

This room provides laboratory hardware and chemicals for undergraduates in the Medicinal Chemistry laboratory and should be connected with the preparation room and the student laboratory.

EQUIPMENT: Sink, shelving, storage cabinets, desk, typewriters, drying rack  
SYSTEMS: 110V, 220V, distilled or deionized water, hot and cold water, intercom  
PERSONNEL: 1 stockroom attendant

#### FACULTY RESEARCH LABORATORIES

Medicinal Chemistry research by faculty. A variety of procedures and goals is performed in these rooms, both chemical and biological. Lab should be connected to corresponding office.

EQUIPMENT: Combination of lab bench-desk, sinks, refrigerator, hood cabinets and shelves, drying oven, vacuum pump, drying rack, balance, miscellaneous small instruments.  
SYSTEMS: Air, gas, steam, vacuum, distilled or deionized water, 110V, 220V.  
PERSONNEL: Faculty member and assistant.

#### POSTDOCTORAL OFFICE-RESEARCH LABORATORIES (3 ONE-MAN LABS)

Medicinal Chemistry research by postdoctoral fellows.

EQUIPMENT: same as above  
SYSTEMS: Intercom, telephone  
PERSONNEL: one man per lab plus assistant.

FACULTY & RESEARCH OFFICES

Space is provided for faculty to prepare lectures, counsel students, and work on research projects. Offices should be adjacent and connected to the research laboratories.

EQUIPMENT: Chairs, desk, files, shelving, chalkboard, typewriter  
SYSTEMS: Telephone, intercom.  
PERSONNEL: 10 faculty

MEDICINAL CHEMISTRY LABORATORY

This is the undergraduate lecture, demonstration and laboratory space for quantitative drug analysis. Exhibit space for periodic chart and other items required. Laboratory bench space of 2' x 5' per student is required.

EQUIPMENT: Lab benches, fume hoods, wall shelves, chalkboard, movie screen, sinks, bench storage, lecture platform, desk, refrigerator, drying oven, tackboard.  
SYSTEMS: Steam, vacuum, gas, distilled or deionized water, air, 110V, 220V, closed circuit TV, intercom.  
PERSONNEL: 75 students, 1 instructor, 3 assistants.

BALANCE ROOM

This space is used by the students to weigh and calculate physical matter when performing experiments in the laboratory. This room should be connected with the Medicinal Chemistry lab but fumes and vapors from the lab must be kept out so the equipment is not destroyed. Balance tables should be free from vibration.

EQUIPMENT: 15 analytical balances, low bench, stools  
SYSTEMS: 110V, rough-in water, gas vacuum, air, steam, 220V  
PERSONNEL: 15 students, 1 assistant

CHEMISTRY PREPARATION ROOM

This space is used by the instructor(s) and his assistant(s) to prepare laboratory demonstrations and material for lab use. Direct access to the Medicinal Chemistry Laboratory and the Satellite Stock Room are necessary.

EQUIPMENT: Sink, high and low bench, base and wall cabinets, refrigerator, incubator, fume hood, shelving, carts, stools, desk, typewriter  
SYSTEMS: Hot and cold water, air, gas, vacuum, 110V, 220V, distilled or deionized water, intercom  
PERSONNEL: 1 graduate assistant

INSTRUMENT LABORATORY

Undergraduate lecture, demonstration and lab space for the teaching of instrumental analysis. 15 stations for different instruments (80 sq. ft. each).

GRADUATE RESEARCH LABORATORIES

Medicinal Chemistry research by graduate students using a variety of procedures and goals is performed in these rooms.

- EQUIPMENT: Combination desk-lab benches, sinks, chairs, stools, autoclave, refrigerator, chemical hood(s), drying racks, drying oven, wall shelving, vacuum pump, balance, miscellaneous small instruments.
- SYSTEMS: Air, gas, steam, vacuum, distilled or deionized water, 110V, 220V, telephone, intercom
- PERSONNEL: 2-4-8 men per lab.

CONFERENCE/REFERENCE/READING ROOM

This area will be a multi-use room for small conferences, graduate oral exams, reference material, and general reading area for students and staff/ This room should be adjacent to that of the Senior Faculty Office and his secretary.

- EQUIPMENT: Conference table, seating, chalkboard, projection screen, book shelves.
- SYSTEMS: 110V, 220V, intercom, telephone
- PERSONNEL: 20 graduate students and/or faculty

INSTRUMENT ROOM:

Instrumentation required for daily research activities will be found in this room.

- EQUIPMENT: Lab benches, sinks, wall shelving, cabinets, IR, UV, and visible spectrophotometers, polarimeters, gas chromatographs, centrifuge, and miscellaneous small equipment.
- SYSTEMS: Gas, vacuum, steam, air, distilled or deionized water, 110V, 220V, intercom, air conditioning and humidity control.
- PERSONNEL: Staff and graduate students

CHROMATOGRAPHY ROOM

Different types of chromatographic processes using various sized chromatographic jars and systems will be employed. Convenient access to the graduate research area is desirable.

- EQUIPMENT: Sink, hood, tables, storage, various chromatographic equipment
- SYSTEMS: Distilled or deionized water, hot water, cold water, vacuum, gas, air, 110V, 220V, temperature control 5-25 degrees C  $\pm$  2 degrees, humidity control
- PERSONNEL: 1-2

COLD ROOM

An environmentally controlled room of 2 - 5 degrees C. Should be in close proximity to the Biological Processes Laboratory.



EQUIPMENT: Bench, shelves, sink, centrifuges  
SYSTEMS: Cold water, distilled or deionized water, vacuum, air, 110V, 220V  
PERSONNEL: 1-4

BIOLOGICAL PROCESSES LABORATORY:

A clean room environment with a constant temperature of 20-40 degrees C  $\pm$  2 degrees. The room will be partitioned (preferably by glass) with a sliding glass door providing access between the two segments. The inner segment will contain a laminar flow work bench and thus will furnish space for aseptic procedures. The only traffic access to this portion will be through the outer segment. The outer portion will be used as a general preparation, clean-up, and tissue growing facility. The general placement of this tissue growing complex should be out of the main traffic flow.

EQUIPMENT: Outer room--S.S. sink, work table, shakers, shelving  
Inner room--Laminar flow work bench, work table  
SYSTEMS: Outer room--Air, gas, steam, vacuum, 110V, 220V, distilled to deionized  
water, hot water, cold water, intercom  
Inner room--110V, 220V, gas, intercom  
PERSONNEL: 1-2

SECRETARY

Space is provided for clerical functions of the department. It should be located adjacent to the Senior Faculty Office and the Conference/Reference/Reading Room and have control of scheduling appointments and usage of both rooms.

EQUIPMENT: Desk, chairs, typewriter, dictating and duplicating equipment.  
SYSTEMS: Telephone, intercom, 110V  
PERSONNEL: 1

VII INTERNAL SPACE RELATIONSHIP:

The secretary's office controls the access to the Conference Room and the department head's office.

The satellite Stock room and the Chemical Preparation room are interconnected and along with the Balance room have direct access to the Medicinal Chemistry laboratory.

The Instrumentation Laboratory should be located in the area of the Medicinal Chemistry laboratory.

Desirable to have complete department on adjacent floors if possible.

VIII OTHER DESIGN CONSIDERATIONS:

There is a need for at least one perchloric acid type hood.

Desirability and need of having 2 (or maybe more) hoods equipped (or readily convertible) for radioactive use. These would be in addition to those in the Radioactivity Synthesis Room. If the Radioactivity Synthesis Room is on the same level as 18.2, then one of these additional hoods should be on the level of 18.3 and one on the level of 18.4.

Closed circuit television and other audio-visual aids are required. ....

## I. FUNCTION:

The function of the Pharmaceutics Department is to (1) provide instruction to undergraduate students regarding the behavior of drugs in pharmaceutically related physical and biological systems, (2) provide graduate students with academic and research training necessary for a career in teaching and/or research, (3) cooperate with other elements of the health sciences in furthering the understanding of the physical and chemical basis of drug therapy.

## II. ACTIVITIES:

Through lectures, demonstrations, and laboratory work undergraduate students are instructed in the preparation of dosage forms, together with their physical, chemical, and pharmacological characteristics. Lectures typically involve 75 to 150 students. Laboratories are designed to illustrate the applications of the basic principles encountered in lecture and are normally of three hours duration. Graduate lectures are offered by the faculty as required. The faculty is in continual contact with the graduate students, both as their research advisors and as laboratory co-workers. This activity involves frequent visits of the graduate students to faculty offices and likewise the faculty must spend a great deal of time in the graduate laboratories. Certain health science facilities may be used on a service basis, such as -- experimental x-ray, clinical chemistry and histopathology.

## III. RELATIONSHIP TO OTHER UNITS:

Undergraduate relates to the pharmacy and chemistry libraries and the Drug Information Center.

Graduate relates in addition to the above to Animal Quarters, Medicinal Chemistry, Pharmacology, Physical Chemistry, and Bio-Chemistry. Faculty relate to the following libraries; chemistry, engineering, math-physics and bio-medical.

## IV. PERSONNEL:

TOTAL	1971	1976
Students (Graduate)	11	74 plus 6 Hospital Pharmacy
Staff	4	9 plus 1 part time
Clerical (Technical)	1	3
Clerical (Non-technical)	0	2

## V. SUMMARY OF REQUIRED SPACES:

SPACE	AREA	NUMBER	1976	1986
			TOTAL	TOTAL
Senior Faculty Office	250	1	250	250
Faculty Offices				
Teaching & Research	130	7	910	1430
Research	130	2	260	520
Dispensing Laboratory Suite				
Laboratory	3000	1	3000	3000
Reference Area	120	1	120	120
Conference Offices	120	2	240	240
Preparation Room	240	1	240	240
Satellite Stock Room	120	1	120	120
Drug Product Display and Study Area	300	1	300	300
Process and Preparation Laboratory				
Student Laboratory	3000	1	3000	6000
Preparation Room	250	1	250	250
Satellite Stock Room	250	1	250	250
Biopharmaceutics/Physical Pharmacy				
Student Laboratory	3000	1	3000	6000
Preparation Room	250	1	250	500
Satellite Stock Room	120	1	120	240
Manufacturing Suite				
Office & Reference Area	130	1	130	130
Testing & Control Lab	500	1	500	730
Storage Room	250	1	250	400
Controlled Humidity Room	200	1	200	200
Drying Area	200	1	200	200
Tablet, Liquid, and Ointment Preparation Area	400	1	400	400
Tablet Coating Room	120	1	120	120
Milling and Grinding Room	120	1	120	120
Parenteral Products Area	200	2	400	600
Faculty Research Laboratories	250	8	2000	3750
Post-doctoral Office/Laboratory	250	4	1000	1500
12-Man Study Laboratory	1400	1	---	1400
Four-Man Graduate Research Lab	800	3	2400	4800
Two-Man Graduate Research Lab	400	4	1600	3200
Cold Room (+ 60 Sq. Ft. -18.1)	30	1	30	30
Special Products Lab (Hospital Pharmacy Graduate Students)	1000	1	1000	2000
Pharmaceutics Conference Room	400	1	400	800
Secretary	150	1	150	150
<b>TOTALS</b>			<b>23,210</b>	<b>39,990</b>

VI. FUNCTIONAL DIVISION:

OFFICES

Space is provided for staff to carry out teaching, research, student counseling, and administrative functions. Offices should be located according to function.

The department head's office, the conference room, and the secretary's office are interrelated so that she has control of access and scheduling for both. Faculty offices should be interconnected with their research labs and be located in the area of the graduate laboratories. Post-doctoral offices-labs should be located near graduate & faculty research labs.

EQUIPMENT: Desk, chairs, files, shelving.

SYSTEMS: Telephone, intra-com.

PERSONNEL: 1 per office.

DISPENSING LABORATORY SUITE

Dispensing Laboratory

This is an undergraduate lecture, demonstration, and laboratory space for learning the final stages in preparing prescriptions. The environment simulates that of a dispensing pharmacy and therefore should be adjacent to a traffic area for visual contact. Students at a later phase then work in the Hospital Dispensing Pharmacy. Students need close access to a sink and typewriter. See prepared pictorial booklet.

EQUIPMENT: High laboratory benches, shelving, pharmaceutical storage cabinets, autoclave balances, telephones, laminar flowhood, sinks, typewriter,

SYSTEMS: Air, vacuum, gas distilled or deion. water, 110V, PA system, hot and cold water.

PERSONNEL: 75 students, 3 teaching assistants, 1 instructor.

Drug Reference Area

This room is used by the students for drug reference. A data processing console linked to the Drug Information Center would be located here.

EQUIPMENT: Desk area, chairs, shelving.

SYSTEMS: Data processing (drug).

PERSONNEL: 5-10

Conference Offices

Space is provided for offices which may also be used for conferences between instructors and students. This should be adjacent to the drug reference room to provide additional reading reference space when not used as an office.

EQUIPMENT: Desk, chairs, shelving.

SYSTEMS: Telephone.

PERSONNEL: 2

Preparation Room

This space is used by the instructor(s) and his assistant(s) to prepare for class lectures, demonstrations, and material for class use. Direct access to the laboratory and the Satellite Stock Room are required. Closed circuit TV for demonstrations performed in the preparation room is desired.

EQUIPMENT: Bench area storage

SYSTEMS: Air, vacuum, gas, distilled or deion water, 110V.

PERSONNEL: Instructor(s) Assistant(s).

Satellite Stock Room

This room stores supplies, equipment, and semi-bulk compounds for use in the laboratory. This room and the preparation room could merge as a work area and be centrally located with regard to student use.

EQUIPMENT: Shelving, pharmaceutical storage cabinets, bench.

SYSTEMS: 110V

PERSONNEL: Assistant.

Drug Product Display and Study Area

This area is used for product display and study; locating it adjacent to the Drug Reference area would concentrate the study areas.

EQUIPMENT: Display counter, tables, chairs, shelving.

SYSTEMS: 110V

PERSONNEL: 75 students.

PROCESS AND PREPARATION LABORATORY

Student Laboratory

This is an undergraduate lecture, demonstration and laboratory space for introductory work in the principal laws of physical chemistry and their applications to the quantitative aspects of pharmaceutical systems.

EQUIPMENT: Hood space 25 lin. Ft., high lab benches, shelving, sinks.

SYSTEMS: Air, vacuum, gas distilled or deion water, 110V, P A system, hot and cold water, steam, 220V.

PERSONNEL: 75 students, 4 teaching assistants, 1 staff.

Preparation Room

See Dispensing Suite.

Satellite Stock Room

See Dispensing Suite.

BIOPHARMACEUTICS/PHYSICAL PHARMACY LABORATORY

Student Laboratory

This is an undergraduate lecture, demonstration, and laboratory space for work in bio-pharmaceutics (drug absorption, distribution, metabolism, and excretion in the human) and physical pharmacy (chemical preparations). Bio-pharmaceutics experiments would like benches with stainless steel tops and sinks arranged for four students per bench. Would like the lab to be adjacent to the Process and Preparation Laboratory so that possibility of opening both and using additional bench space could exist for either.

EQUIPMENT: High lab benches, shelving, sinks, hoods 50 lin. ft.

SYSTEMS: Air, vacuum, gas, distilled or deion. water, lloV, public address system, hot and cold water, steam.

PERSONNEL: 75 students.

Preparation Room

See Dispensing Suite.

Satellite Stock Room

See Dispensing Suite.

MANUFACTURING SUITE

All rooms of this suite should have tiled floor and walls and should be glass separated.

Offices and Reference

Space is provided for clerical work involved in operating the suite; visual work is maintained from here. A Reference Area is also provided for student use.

EQUIPMENT: Desk, table, chairs, files, shelving.

SYSTEMS: Telephone

PERSONNEL: 2

Testing and Control Laboratory

This laboratory will assay and provide quality control of items manufactured. It will also provide instrument space for the graduate laboratories and should

be located in that area. Electrical shielding is required.

EQUIPMENT: Laboratory base and wall cabinets, sinks, still.

SYSTEMS: Air, vacuum, gas, 110, 220V, voltage controlled lines, humidity control 40%, hot and cold water, dist. or deion. water.

PERSONNEL: 2-4

#### Storage Room

This area stores all raw pharmaceutical materials and other bulk supplies required by the Suite.

EQUIPMENT: Shelving.

#### Controlled Humidity Area

An environmentally controlled room. This room should be accessible from the drying area and the tablet, liquid, and ointment area.

EQUIPMENT: Benches, shelving, floor drains.

SYSTEMS: Humidity controlled mech., 110, 220V, gas.

PERSONNEL: 12 students.

#### Drying Area

This area is used for drying various solids mixtures.

EQUIPMENT: Drying ovens, floor drain.

SYSTEMS: 110V, 220V.

PERSONNEL: 2 staff or students.

#### Tablet, Liquid and Ointment Preparation Area

Preparation area for converting drug compounds into tablet, liquid, and ointment form. Steam cleaning of machinery is required.

EQUIPMENT: Low benches, sink, shelving, tablet presses, mixers, vats.

SYSTEMS: 110V, 220V, air, vacuum, steam, hot and cold water, distilled water.

PERSONNEL: 2 staff or students

#### Tablet Coating Area

This area is for coating drugs in tablet form. Dust generated through work procedure is a hazard and must be eliminated. Volatile solvents are also used.

EQUIPMENT: Dust hoods, coating equipment.

SYSTEMS: 110V, 220V, air, vacuum.

PERSONNEL: Two staff or students.



Milling and Grinding Room

This area is where the raw pharmaceutical materials are milled for use in compounding drugs.

EQUIPMENT: Grinders, dust hoods.  
SYSTEMS: 110V, 220V.  
PERSONNEL: 2 staff or students.

Parenteral Products Area

Principles and procedures involved in manufacture of parenteral products are taught in this area. Bulk solutions are prepared in this room. The room must be sterile (completely scrubbed down) with air filtration equipment and positive pressure.

EQUIPMENT: Benches, sinks, autoclave, dishwasher, still, laminar hood.  
SYSTEMS: 110V, 220V, distilled or deion. water, air, vacuum, steam.  
PERSONNEL: 10 staff or students.

Research Laboratories

This space provides pharmaceutical research for graduate students and staff. The laboratory space should provide a reasonable degree of privacy. Faculty laboratories should be interconnected with office. Research in faculty, post-doctoral, and graduate labs is essentially chemical but occasionally includes small animal work. Graduate laboratories should be positioned so as to locate 4-5 graduate students near each faculty office. Departmental animal rooms should be near 1/3 of these labs.

EQUIPMENT: Chemical hoods, lab benches, desks, chairs, stoves, sinks.  
SYSTEMS: Gas, hot and cold water, distilled or deion. water, air, vacuum, steam, 110V, 200V.  
PERSONNEL: 1-2-4 men per lab

COLD ROOM:

An environmentally controlled room of 2-5 degrees C. Should be located in the area of the faculty and graduate research laboratories.

EQUIPMENT: Bench, shelves, sink, centrifuges.  
SYSTEMS: Cw, dist. or deion. water, vacuum, air, 110 V, 220 V.  
PERSONNEL 1-2

SPECIAL PROJECTS LABORATORY:

This research laboratory will be used by 6 graduate students in the Hospital Pharmacy master's program and should be located in the same area as the graduate research laboratories. Some open floor space with "utility poles" to service free-standing equipment is desired.

EQUIPMENT: Chemical hoods, lab benches, desks, chairs, stoves, sinks.  
SYSTEMS: Gas, hw, cw, dist. or deion. water, air, vacuum, steam, 110V, 220V  
telephone.  
PERSONNEL: 6 students

CONFERENCE ROOM:

This room is used by students and staff of the Pharmaceutics Department for various conferences and seminars.

EQUIPMENT: Conference table, chairs, chalkboard.  
SYSTEMS: Telephone, intercom, 110V.  
PERSONNEL: 30 people.

SECRETARY:

Space is provided for clerical functions of the department. It should be located adjacent to the Senior Faculty Office and the Conference room and have control of scheduling appointments and usage of both rooms.

EQUIPMENT: desk, chairs, typewriter, dictating and duplicating equipment.  
SYSTEMS: Telephone, intercom, 110V.  
PERSONNEL: 1

VII. INTERNAL SPACE RELATIONSHIPS:

The secretaries office should have control of persons entering both the department head's office and the conference room. The conference room should also be accessible from the department head's office.

The testing and control laboratory should be in the general area of graduate/faculty research.

The support functions of the Process and Preparation laboratory and the Biopharmaceutics/Physical Pharmacy laboratory may be combined in order to cut down on staffing requirements and space requirements.

VIII. OTHER DESIGN CONSIDERATIONS:

The testing and control laboratory and possibly one of the two-man graduate laboratories should be properly shielded from outside interference.

The manufacturing suite minus the testing and control lab might be integrated into the Hospital Pharmacy. The problem other than the physical limitations of available area for such incorporation, phasing, etc., is the concern of Pharmacy that the space always be available for teaching since Hospital Pharmacy because of economy, etc., does not employ all manufacturing procedures the College wishes to teach.

All undergraduate facilities should have closed circuit television and other audio-visual aids.

Special hood or hoods for radioactive work required (see Section VIII of 18.3 Medicinal Chemistry.)

## I. FUNCTION:

The function of Pharmacy Administration is to educate undergraduate and graduate students in the social, economic, legal and political implications of pharmaceutical services, and the environment in which they are provided.

## II. ACTIVITIES:

Through lectures, demonstrations and laboratory work students are instructed in all aspects of pharmacy administration.

## III. RELATIONSHIP TO OTHER UNITS:

Pharmacy Administration consistently works with the last two professional year in the College of Pharmacy.

## IV PERSONNEL:

TOTAL	1971	1976
Students - Graduate	1	10
Staff	2	4
Clerical (non-technical)	0	2

## V. SUMMARY OF REQUIRED SPACES:

SPACE	AREA	NUMBER	1976 TOTAL	1986 TOTAL
Senior Faculty Office (+1 secretary)	250	1	250	250
Faculty Offices				
Teaching & Research	130	2	260	520
Research	130	1	130	260
Pharmacy Administration Lab Suite				
Analysis & Calculating Lab	500	1	500	800
Reference Room	400	1	400	400
Student Laboratory	1500	1	1500	3000
Conference Room	400	1	400	400
Graduate Suite	1000	1	1000	2500
TOTALS			4440	8130

## VI. FUNCTIONAL DIVISION:

OFFICES

Space is provided for staff to carry out teaching, research and administrative functions.

EQUIPMENT: Desk, chairs, files, shelving, typewriters, Dry Copier Dictation equipment, addressograph, small desk calculator.

SYSTEMS: Telephone, intercom.

PERSONNEL: 1

#### PHARMACY ADMINISTRATION LABORATORY SUITE

##### Analysis and Calculating Laboratory

This laboratory should be divided into a graduate and undergraduate area. The graduate area contains expensive equipment, computers, etc., and must be locked. The undergraduate area which should be available all the time contains 10 desk calculators along one wall.

EQUIPMENT: Computer terminal, input equipment, 10 desk calculators and 1 desk computer, shelving, desk, chairs, files (punch cards), NCR-53 or similar.

SYSTEMS: Intercom, telephone.

PERSONNEL: Electronics technician, graduate students in Pharmacy Administration and Hospital Pharmacy.

##### Reference Room

This space is used by the student to study Pharmacy Administration reference material.

EQUIPMENT: Tables, chairs, shelving, microfilm microphage reader, PCMI.

SYSTEMS: Telephone, intercom, storage files for above.

PERSONNEL: Monitored by Departmental Secretary.

##### Student Laboratory

This is an undergraduate laboratory where lectures and student role playing take place. An amphitheater arrangement with continuous writing desks overlooking a stage area with movable backdrops is desired. Backdrops, audio-visual and projection techniques will be employed. Would also like to be able to divide the laboratory into three areas. A preparation and storage room for audio-visual equipment and aids is needed.

EQUIPMENT: Writing desks, chairs, mobile A\_V equipment, backdrops for simulated role playing, blackboards, projection screen.

SYSTEMS: CCTV, amplifier, ceiling speakers, intercom, A-V prep room at one side, A-V storage area.

PERSONNEL: 30-40 students.

##### CONFERENCE ROOM:

This space is used by the students and staff of Pharmacy Administration for conferences and seminars. Monitored by Departmental Secretary.

EQUIPMENT: Conference table, chairs, shelving, chalkboard.  
SYSTEMS: Telephone, intercom, conference recording equipment.  
PERSONNEL: 15-30

GRADUATE SUITE:

Research and work space for graduates students in Pharmacy Administration.

EQUIPMENT: Desks, chairs, shelving, file cabinets, chalkboard, work benches.  
SYSTEMS: Telephone, 110v, 220v.  
PERSONNEL: 5-10 students

VII. INTERNAL RELATIONSHIPS:

The secretary should monitor the department head's office and the other faculty offices in addition to the Conference Room.

The Conference Room and the Reference Room should be adjoined by a folding partition.

The graduate suite should be adjacent to the Analysis and Calculating Laboratory.

VIII. OTHER DESIGN CONSIDERATIONS:

The physical facilities planned for Pharmacy Administration should be somewhat flexible in nature since the development of their curriculum is a continuing one not based on previous courses or philosophy. This Department should be closely integrated with Clinical Pharmacy. Closed circuit television and other audio-visual aids are required.

I. FUNCTION:

The function of the Clinical Pharmacy Department is to educate undergraduate students and graduate students in Hospital Pharmacy in the biological, economic, ethical, legal, political and social factors which affect the selection, use adverse effects, abuse and non-use of drugs in our society.

II. ACTIVITIES:

Students are instructed in Clinical Pharmacy through lectures, review of patient therapy in hospital, and clinical instruction in Pharmacies throughout the area. Graduate students do research in the practice of pharmacy in an institutional setting.

III. RELATIONSHIP TO OTHER UNITS:

Clinical Pharmacy uses faculty and facilities within the Hospital Pharmacy system for student instruction.

Clinical Pharmacy uses the Drug Information Center.

The Clinical Pharmacy program places some students in the Veterans Administration Hospital, Hennepin County General Hospital, St. Paul-Ramsey Hospital, and Cambridge State Hospital, as well as the University of Minnesota Hospitals. Several community practice settings such as St. Louis Park Medical Center, Appel Pharmacy, and others are used. Hospital pharmacy graduate students relate to the Special Products Laboratory of the Pharmaceuticals Department and also to the Pharmacy Administration Department.

Graduate Hospital Pharmacy works with Public Health, Pharmacology, Business Administration, Pharmaceuticals, and Data Processing, and occasionally works with Anthropology, Sociology, and Educational Psychology.

IV. PERSONNEL:

TOTAL	1971	1976
Staff	15	20
Clerical (Technical)	0	2
Clerical (Non-Technical)	2	4

Only undergraduate personnel at this time. Advanced degrees in Pharmacy Administration and Hospital Pharmacy (Pharmaceutics) are included in their respective Departments.

## V. SUMMARY OF REQUIRED SPACES:

SPACE	AREA	NUMBER	1976 TOTAL	1986 TOTAL
Faculty Offices				
Teaching	130	1	130	390
Teaching and Service	130	3	390	780
Faculty, Office/Lab	125	4	500	3000
Clinical Pharmacy Conference Room	400	1	400	400
Hospital Pharmacy Grad. Labs	80	10	800	1700
TOTALS			2220	6270

## VI. FUNCTIONAL DIVISION:

OFFICES

Space is provided for staff to carry out teaching, service and administrative functions.

EQUIPMENT: Desk, chairs, files, shelving.

SYSTEMS: Telephone, Intercom, 110 V.

PERSONNEL: 1

FACULTY OFFICE LABORATORY

This space is used for detailed investigation beyond floor study to investigate dosage forms, to change formulas, to study drug blood levels, etc. Graduate residency candidates (PharmD Candidates) would use these laboratories in the same manner. Clinical faculty will also have office facilities in their clinical setting at St. Paul Ramsey, Hennepin County General Hospital, etc.

EQUIPMENT: Desk, chairs, files, shelving, sink.

SYSTEMS: Air, vacuum, gas, steam 110 V, 220 V, hoods, telephone, intercom, hw,cw.

PERSONNEL: 1

CONFERENCE AND REFERENCE ROOM:

This space is used by the students and the staff for conferences and seminars.

EQUIPMENT: Conference tables, chairs, shelving, chalkboards.

SYSTEMS: Telephone, intercom, 110 V.

PERSONNEL: 15-30

HOSPITAL PHARMACY GRADUATE LABORATORIES

This space provides bench space for graduate students' kinetic research and for PharmD candidates. Instead of individual 80 sq. ft. rooms one large room with facilities for 10 separate individuals may be more feasible, in regard to services provided.

EQUIPMENT: Desks, tables, chairs, file cabinets, shelving, sinks.

SYSTEMS: Air, vacuum, gas, steam, 110v, 220v, hoods, hw, cw dist. or deion. water.

PERSONNEL: 10

VII. INTERNAL RELATIONSHIPS:

Within the College of Pharmacy, the Clinical Pharmacy Department relates most strongly to the Pharmacy Administration Department and at the present time are headed by the same individual. These two departments should therefore be planned adjacent to one another. This would give the College a great deal of overall planning flexibility for the future not knowing the direction or magnitude of the program's development. At the present time only graduate students relate to the Pharmacy Administration Department and all undergraduate functions are carried out by the Clinical Pharmacy Department.

In general, the Clinical Pharmacy Department relates to other hospital functions as outlined in the program.

Shared service systems will be essential for the ten students placed in the Hospital Pharmacy Graduate Laboratories.

VIII. OTHER DESIGN CONSIDERATIONS:

Closed Circuit television and other audio-visual aids are essential.



DELETED FROM PROGRAM.

I. FUNCTION:

The functions of the College Administration is to establish policy, curricula and in general run the College of Pharmacy and its Continuing Education program.

II. ACTIVITIES:

Administering the operations of the College of Pharmacy involves setting up curricula, scheduling of classes, student registrations, student counseling, undergraduate records, and communication.

III. RELATIONSHIP TO OTHER UNITS:

The Administration Department relates to all the departments within the College of Pharmacy.

There is a relationship with the University Policy Committee, the University, Business and Administration Offices, the Business Equipment Center, the University Continuation Center, the Health Science Center Administration, and with the Health Sciences Continuing Education Center. There is also a relationship to the public -- guests, visitors, and parents.

IV. PERSONNEL:

	<u>1971</u>	<u>1976</u>	<u>1986</u>
Dean	1	1	1
Secretaries	6	8	14
Associate Dean	0	1	1
Assistant Dean	1	1	1
Director Continuing Education	1	2	3

V. SUMMARY OF REQUIRED SPACES:

<u>SPACES</u>	<u>AREA</u>	<u>NUMBER</u>	<u>1976 TOTAL</u>	<u>1986 TOTAL</u>
Dean's Office	375	1	375	375
Secretary to the Dean	170	1	170	170
Secretary of the College	170	1	170	170
Associate Dean	200	1	200	200
Assistant to the Dean	200	1	200	200
Secretary	130	1	130	130
Clerk/Stenographers	500	1	500	500
Business Office	400	1	400	800
Business Manager	175	1	175	175
Records/Workroom	200	1	200	400
Conference Room	400	1	400	400
Director, Continuing Education	250	1	250	250
Assistant, Continuing Education	175	1	175	525
Secretary, Continuing Education	250	1	250	500
<b>TOTALS</b>			<b>3595</b>	<b>4795</b>

VI. FUNCTIONAL DIVISION:

OFFICES

Space is provided to the staff for administrative procedures.

EQUIPMENT: Desks, chairs, shelving, files.

SYSTEMS: Telephone, intercom., dictating equipment.

PERSONNEL: 1 per office.

CLERK/STENOGRAPHERS POOL

This area is used as a secretarial pool performing administration business procedures for all the departments within the College of Pharmacy. It should have direct access to the record and work room and the business office. A waiting and general notice area for students and staff should be adjacent to the pool. The pool will be supervised by the Secretary of the College. Registration and other student activity will take place in this area. Therefore, especially during certain times of the academic year, use will be heavy. Waiting areas and traffic flow should be heavily considered for this function.

EQUIPMENT: Typewriters, desks, files, chairs, shelving.

SYSTEMS: Telephone, data processing, intercom.

PERSONNEL: 5-10

BUSINESS OFFICE

The business Office transacts and records business procedures of the department; purchasing, payment, and budget. It also works with the Administration Department of the University of Minnesota in regard to student admission and fee payment.

EQUIPMENT: Files, typewriters, desks, chairs, shelving, dictating equipment, adding machines, desk calculators.

SYSTEMS: Telephone, intercom, data processing.

PERSONNEL: 3-4

RECORDS/WORKROOM

This space is used for storage of student, research, and administrative records and for duplicating procedures. Noise should be contained within the room. Student files must be accessible to Dean, Associate Dean, and their secretaries. Vault for records.

EQUIPMENT: Files, Xerox, mimeo, ditto, collator, etc., worktables, stools, storage.

SYSTEMS: Intercom

PERSONNEL: 1-2

CONFERENCE ROOM

This room is used by the Administrative staff and the Teaching and Research staff for conferences, seminars, and interviews. Should be controlled by the Dean's secretary and be accessible from the V.I.P. waiting area and the Dean's office. This room and the Dean's suite should share coat storage.

EQUIPMENT: Conference table, chairs, chalkboard, shelving movie screen, kitchenette.

SYSTEMS: Telephone, intercom, variable lighting.

PERSONNEL: 25 people.

VII. INTERNAL RELATIONSHIPS:

There should be a separate waiting space for V.I.P.'s near the dean's secretary. This should be located away from the activity of the general business and steno pool.

The secretary to the dean will act as social hostess to any V.I.P.'s visiting the College. She will also schedule the conference room and be in charge of the adjacent kitchenette unit, coffee service and lunches to the conference room.

The Dean's, Associate Dean's, Assistant Dean's, and continuing education offices relate to each other, the stenographers' pool, and the public.

The conference room should relate to the dean's suite and the public.

Continuing Education office relates to staff, Nolte Center, and Health Sciences Center for Continuing Education, the Record/Workroom, and the public.

All relate to the faculty and staff, public and students.

Although the Continuing Education suite must be in the area of College Administration, it is not necessary to closely integrate it with the other offices of this section.

Student traffic flow should be considered.

There will be a strong relationship between the Administration set-up in the College of Pharmacy and the corresponding segments of the other Health Sciences.

VIII. OTHER DESIGN CONSIDERATIONS:

Continuing Pharmacy education prepares tapes, brochures, etc. for distribution to a number of cities for those enrolled in the program under the extension division of the University. A need exists for a work area for this and increasing audio-visual usage. A centralized Continuing Education Center for all the Health Sciences would play a part in this planning.

There are several alternate ways in which telephone calls, mail and announcements/notifications can be handled. The most reasonable seems to be by handling it through the individual departments; i.e., the department secretary will have a call director and will handle the calls for the Department.

Proximity of toilet facilities for steno pool and visitors.

Steno pool employees would like to leave desk and go to lounge-vending area for their breaks.

Noise produces by various procedures employed in the Workroom should be confined to that area.