

HEALTH PROFESSIONS
EDUCATIONAL FACILITIES CONSTRUCTION

HEALTH SCIENCES
UNIVERSITY OF MINNESOTA

Unit F
College of Pharmacy
School of Nursing

March 17, 1975

UNIVERSITY OF MINNESOTA
Health Sciences

UNIT F

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
WASHINGTON, D.C.

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APPLICATION FOR FEDERAL ASSISTANCE
FOR CONSTRUCTION OF HEALTH
AND EDUCATIONAL FACILITIES

STATE	DHEW
Date Rec'd.	
Project Number	

GENERAL INFORMATION

<p>1. LEGAL NAME OF APPLICANT</p> <p>Regents of the University of Minnesota</p>	<p>2. ADDRESS OF APPLICANT (<i>street, city, country, congressional district, state, zip code, and telephone number</i>)</p> <p>202 Morrill Hall University of Minnesota Minneapolis, Minnesota 55455 (612) 373-2025 5th Congressional District</p>
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3. APPLICANT APPLIES FOR FEDERAL FUNDS FOR CONSTRUCTION UNDER THE FOLLOWING PROGRAM(S):

(A) <u>CODE NO.</u> <i>(See Program Instructions)</i>	<u>SHORT TITLE</u>	<u>(B) GRANT AMOUNT</u>	<u>OTHER (IDENTIFY)</u>
(1) 41	Health Professions	\$ 4,823,761	\$ _____
(2) 43	Nursing	\$ 4,395,412	\$ _____
(3) _____	_____	\$ _____	\$ _____
(4) _____	_____	\$ _____	\$ _____

<p>4. PROPOSED FACILITY AND PROJECT</p> <p>(A) Name and Type</p> <p>Health Sciences - Unit F University of Minnesota</p> <p>Teaching Facilities for School of Nursing and College of Pharmacy</p> <p>(B) Address (<i>street, city, county, congressional district, state, zip code</i>)</p> <p>University of Minnesota Minneapolis, Minnesota 55455</p>	<p>(C) Type of construction (<i>Check all that apply</i>)</p> <p><input checked="" type="checkbox"/> New facility <input type="checkbox"/> Expansion of existing facility <input type="checkbox"/> Remodeling <input type="checkbox"/> Acquisition <input type="checkbox"/> Equipment only <input type="checkbox"/> Other (<i>specify</i>)</p> <p>(D) Type of Ownership</p> <p><input checked="" type="checkbox"/> Public <input type="checkbox"/> Other Nonprofit</p> <p>(E) Type of operational control in other than the owner</p> <p><input checked="" type="checkbox"/> Public <input type="checkbox"/> Other Nonprofit</p>
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<p>5. APPLICANT'S REPRESENTATIVE (<i>Name, title, address, telephone number</i>)</p> <p>Clinton T. Johnson, Assistant Vice President, Business Administration and Treasurer University of Minnesota 302 Morrill Hall Minneapolis, Minnesota 55455 (612) 373-2058</p>	<p>6. PROJECT ARCHITECT (<i>Name, address, telephone number</i>)</p> <p>The Architects Collaborative, Inc. Architects and Master Planners 46 Brattle Street Cambridge, Massachusetts 02138 (617) 868-4200</p>
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PROGRAM INFORMATION

7. APPLICANT ELIGIBILITY AND NEED FOR FACILITY See page
(See program instructions for detailed requirements for this item)
8. OCCUPANCY DATA See page
(See program instructions for detailed requirements for this item)
9. DESCRIPTION OF PROGRAMS TO BE CONDUCTED IN FACILITY See page
(See program instructions for detailed requirements for this item)
10. DESCRIPTION OF FACILITY See page
(See program instructions for detailed requirements for this item)

FACILITY INFORMATION

11. APPLICANT'S FINANCIAL RESOURCES APPLICABLE TO THIS FACILITY

- A. Cash and negotiable and non-negotiable securities \$ _____
- B. Pledges: Face value: \$ _____
 Discounted Value \$ _____
- C. Contingent gifts and bequests \$ _____
- D. Bonds authorized but not yet sold \$ _____
- E. Mortgage \$ _____
- F. Appropriations:

	1969 -	Available (specify date)	Anticipated (specify date)
State	1971 -	\$ 318,000	\$ 10,060,365 - 1976
Local		\$ _____	\$ _____

TOTAL \$ 11,729,765

G. Other (Specify) \$ _____

H. TOTAL \$ _____

12. OTHER FEDERAL ASSISTANCE FOR THIS PROPOSED FACILITY

	PROGRAM	FED. AGENCY	STATUS	AMOUNT	PROJECT NUMBER
A.					
B.	NONE	NONE	NONE	NONE	NONE
C.					

13. TOTAL DEVELOPMENT COST

(Sum of items 3, 11, and 12) \$ 20,948,938

14. SITE AND IMPROVEMENTS

A. Title or Other Interest in Site is ~~or will~~ be Vested in:

X Applicant _____ Agency or institution which is to operate the facility
_____ Other (specify)

B. Indicate whether applicant/operator has:

_____ Fee simple title _____ Leasehold interest _____ Other (specify)

C. If applicant/operator has leasehold interest, give following information:

(1) Length of lease or other estate interest: _____

(2) Number of years to run: _____

(3) Is lease renewable? ___ Yes ___ No

(4) Current appraised value of land: \$ _____

(5) Annual rental: \$ _____

D. Attach an opinion from acceptable title counsel describing the interest applicant operator has in the site and certifying that the estate or interest is legal and valid.

E. Attach site survey, soil investigation reports and where applicable copies of land appraisals.

F. Where applicable attach certification from architect on the feasibility of improving existing structures.

G. Attach plot plan.

15. CONSTRUCTION SCHEDULE ESTIMATES:

A. Target dates for completion of drawings:

Schematics Complete Preliminary Complete Final November, 1975

B. Target dates for: Bid advertising April, 1976; Contract award June, 1976;

Construction completed June, 1978; Occupancy June-December, 1978;

16. BUDGET INFORMATION
ESTIMATED FACILITY BUDGET

A. Building identification: _____
(if more than one structure)

B. Budget Line	C. New construction	D. Other (identify)	E. Total
1. Building work			
a. General construction	\$ 9,141,530	\$ ---	\$ 9,141,530
b. Plumbing	1,191,070	---	1,191,070
c. Heating, air cond., ventilation	2,392,730	---	2,392,730
d. Electrical work	1,422,400	---	1,422,400
e. Elevators	315,940	---	315,940
f. Other building work (attach list and itemization of costs)	11,000	---	11,000
g. TOTAL FOR BUILDING WORK	14,474,670	---	14,474,670
2. Site work			
a. Site preparation	3,000	---	3,000
b. Site development and parking facilities	165,000	---	165,000
c. Utility connecting lines	51,000	---	51,000
d. Special use items	---	---	---
e. TOTAL FOR SITE WORK	219,000	---	219,000

ESTIMATED FACILITY BUDGET (Cont'd.)

B. Budget Line	C. New construction	D. Other (identify)	E. Total
3. Off-site work			
a. Connecting lines to central utility plant	\$	\$	\$
b. Other items (list and itemize costs)			
c. TOTAL FOR OFF-SITE WORK			
4. Central utility plant (prorata share for this structure)	239,817	---	239,817
5. TOTAL-CONSTRUCTION COSTS	14,933,487	---	14,933,487
6. Built-in equipment	824,030	---	824,030
7. Architectural and engineering costs			
a. Architect's basic fee	1,130,139		1,130,139
b. Supervision and inspection (project representative)	191,096	---	191,096
c. Surveys, tests, and borings	37,000	---	37,000
d. Other items (list and itemize costs)	60,000	---	60,000
e. TOTAL-ARCHITECTURAL AND ENGINEERING COST	1,418,235	---	1,418,235

ESTIMATED FACILITY BUDGET (Cont'd.)

B. Budget Line	C. New construction	D. Other (<i>identify</i>)	E. Total
8. Movable equipment	\$ 2,293,155	\$ ---	\$ 2,293,155
9. TOTAL COST FOR CONSTRUCTION FIXED EQUIP. A/E FEES AND MOVABLE EQUIPMENT	19,468,907	---	19,468,907
10. Contingency	458,631	---	458,631
11. Purchase of Land	1,021,400	---	1,021,400
12. Purchase of Buildings			
13. Other (<i>list and itemize</i>)			
14. Subtotal-Lines 9 to 13 incl.			
15. Works of Art			
16. TOTAL DEVELOPMENT COST	\$ 20,948,938	\$ ---	\$ 20,948,938

17. SPACE ALLOCATION BY GRANT PROGRAM

A. Building identification (if more than one structure) _____					
B. Gross area in facility <u>213,039</u> S.F.		C. Net area in facility <u>111,584</u> S.F.			
Alternate I	GRANT PROGRAMS				APPLICANT SPACE
	1) PROGRAM CODE	2) PROGRAM CODE	3) PROGRAM CODE	4) PROGRAM CODE	
D. Net area by program(s)	56,384 SF	37,457 SF	SF	SF	17,742 SF
E. Cost allocation ratio by programs (D/C X 100—to two decimals)	50 %	34 %	%	%	16 %
Alternate II					
F. Gross area by program(s)	SF	SF	SF	SF	SF
G. Cost allocation ratio by programs (F/B X 100—to two decimals)	%	%	%	%	%

18. COSTS ELIGIBLE FOR FEDERAL PARTICIPATION
(BY PROGRAMS)

A. Budget line	B. Total cost (col. E, item 16)	C. Total eligible cost	D. Amounts eligible for Federal participation (for each grant program)			
			1) Program code 41, 50 % from item 17E X or 17G	2) Program code 43, 54 % from item 17E X or 17G	3) Program code ____, ____ % from item 17E ____ or 17G	4) Program code ____, ____ % from item 17E ____ or 17G
1g. Building work	\$ 14,474,670	\$ 14,474,670	\$ 7,237,335	\$ 4,921,388	\$	\$
2e. Site work	219,000	133,508	66,754	45,393		
3c. Off-site work	---	---	---	---		
4. Central utility plant	239,817	239,817	119,908	81,538		
6. Fixed equipment	824,030	824,030	412,015	280,170		
7e. A/E costs	1,418,235	871,235	435,617	296,220		
8. Movable equipment	2,293,155	2,293,155	1,146,577	779,673		
10. Contingency	458,631	458,631	229,315	155,935		
11. Purchase of Land	1,021,400	---	---	---		
12. Purchases of Building(s)						
13. Other						
15. Works of Art						
16. TOTALS (1g. through 15)	\$ 20,948,938	\$ 19,295,046	\$ 9,647,521	\$ 6,560,317	\$	\$
17. Amount of Fed. Assist Requested			\$ 4,823,761	\$ 4,395,412	\$	\$
18. Fed. Share Request- Percentage			50%	67%	%	%



UNIVERSITY OF MINNESOTA
TWIN CITIES

Office of the University Attorney
330 Morrill Hall
Minneapolis, Minnesota 55455
(612) 373-3446

March 29, 1974

Regents of the University of Minnesota
Fourth Floor, Morrill Hall
Minneapolis, Minnesota 55455

Attention: Duane A. Wilson, Secretary

Re: Title Opinion
Health Science Expansion - Unit F

Gentlemen:

I have investigated and ascertained the location of the site or sites, rights-of-way, and easements being provided by the applicant for the facilities in its application for Federal Aid identified above to be constructed, operated and maintained thereon, described as follows:

All of the northerly 187.75 feet of "Barney's Subdivision of Block 30" City of St. Anthony as on file in the office of the Register of Deeds, Hennepin County, Minneapolis, Minnesota, lying south of the southerly right of way line of Minnesota Highway #12.

I have examined the records of ownership of said sites and the applicant holds fee simple title, free and clear of all liens and encumbrances except for the following:

The alley adjacent to the westerly property line of said Lots 1, 2, 3 and 4 which will be vacated.

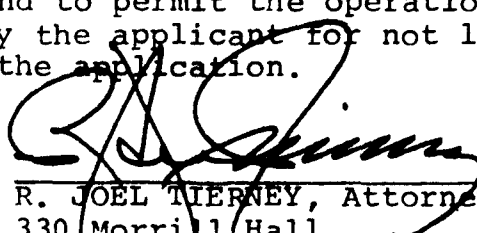
The encroachment above ground elevation North of the South line of Washington Avenue, also known as Minnesota Highway #12. The easement for this encroachment is being obtained by the Minnesota Highway Department.

March 29, 1974

Regents of the University of Minnesota
Page Two

In my opinion, the applicant has and will have upon completion of vacated alley and air rights, sufficient legal interest in the said site, rights-of-way, and easements to permit the construction of such facilities thereon and to permit the operation and maintenance of such facilities thereon by the applicant for not less than seventy-five years from the date of the application.

Dated: March 29, 1974



R. JOEL TIERNEY, Attorney at Law
330 Morrill Hall
University of Minnesota
Minneapolis, Minnesota 55455

EXHIBIT E

The following narrative was taken from the Soil Exploration Company Report dated July 5, 1968, Health Sciences Soil Investigation.

SITE AND SOIL CONDITIONS

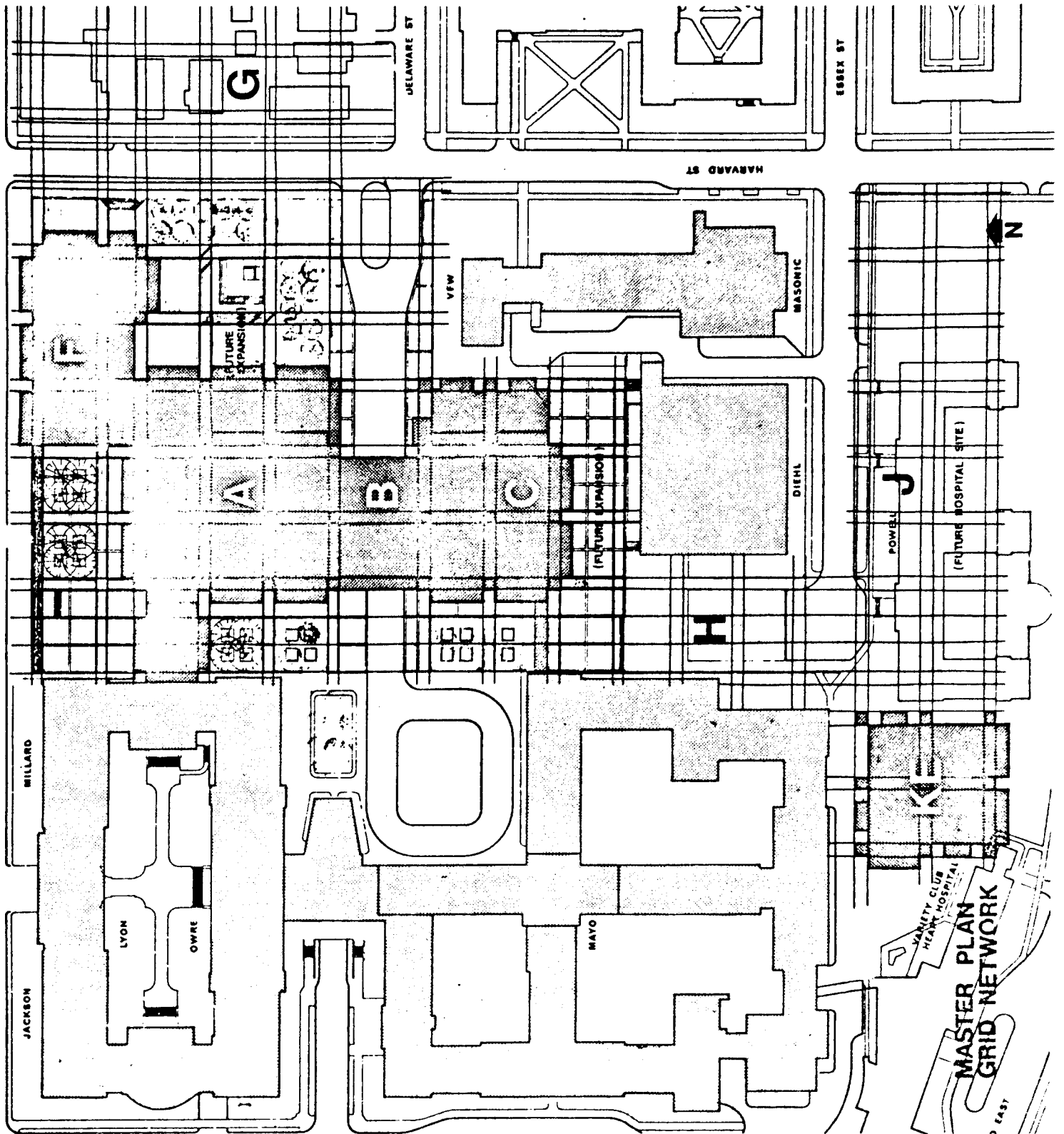
The proposed construction site is located on the University of Minnesota campus in an area which is quite heavily built up. The surface is quite level, with surface elevations at the boring locations varying from approximately 840.5 to 843 feet.

As indicated by the boring logs, the soil profile consists primarily of sand to a depth of approximately 15' to 19', underlain by glacial till consisting primarily of silty sand with some boulders which extends to bedrock. From 4' to 7' of fill exists at the surface, with the greater depth being encountered in Boring No. 3. A layer of silty sand from 7' to 9' was encountered in boring No. 3 and in boring No. 2 a layer of lean clay was encountered from 27.5' to 29.5'. Although boulders were encountered in the till below about 20', the borings were not obstructed by them. Bedrock was encountered and cored in each boring, and consists of thin layers of the Decorah, Shale, and Limestone overlying Platteville limestone at a depth of approximately 50'. Detailed information pertaining to the bedrock is contained on the boring logs.

GROUND WATER

Ground water was observed in the borings at the levels and times indicated on the boring logs. The ground water information contained on the log of boring No.3 is considered to be the most accurate since water was observed at a depth of 43' prior to introducing jetting water into the drill hole. The levels of the ground water observed in borings No. 1 and No. 2 may be affected somewhat by the fact that jetting water was introduced into these holes prior to the time ground water was observed. Ground water determinations made in relatively impervious soils as encountered in the borings may not be completely reliable even after several days of observation, and both yearly and seasonal fluctuations in the level of the ground water may be expected.

EXHIBIT G



19. ASSURANCES

The following assurances are divided into two parts. Part A assurances are required for all applicants applying for construction program support, including the acquisition of facilities where applicable, from the Department of Health, Education, and Welfare. Part B assurances are ones which relate only to individual construction grant or loan programs. Signature by the applicant's representative will indicate that the institution agrees to all Part A assurances and to the Part B assurances required by the program or programs to which it is applying for support.

The applicant gives assurance that:

Part A.

1. It possesses legal authority to apply for and receive the grant or loan, and to finance and construct the proposed facilities; that a resolution, motion or similar action has been duly adopted or passed as an official act of the applicant's governing board, authorizing the filing of the application, including all understandings and assurances contained therein, and directing and authorizing the person identified as the official representative of the applicant to act in connection with the application and to provide such additional information as may be required.
2. It will comply with the provisions of the National Environmental Policy Act, PL 91-190; Executive Order 11296, relating to flood-plain elevation and necessary controls; and Executive Order 11288 relating to the prevention, control, and abatement of water pollution.
3. Sufficient funds will be available to meet the non-Federal share of the cost of constructing the facility, and that sufficient funds will be available when construction is completed to assure effective operation and maintenance of the facility for the purposes for which constructed.
4. Approval by the HEW Secretary or his designee* of the final working drawings and specifications will be obtained before the project is advertised or placed on the market for bidding; that it will construct the project, or cause it to be constructed, to final completion in accordance with the application and approved drawings and specifications; that it will submit to the Secretary or his designee for prior approval changes that materially alter the scope or costs of the project, use of space, or functional layout; that it will not enter into a construction contract(s) for the project or a part thereof until the conditions of the construction grant or loan programs have been met.
5. Except as otherwise provided by State/local law, all contracting for construction (including the purchase and installation of built-in equipment) shall be on a lump sum fixed-price basis, and contracts will be awarded on the basis of competitive bidding with award of the contract to the lowest responsive and responsible bidder. The provision for exceptions based on State and local law will not be invoked to give local contractors or suppliers a percentage preference over non-local contractors bidding for the same contract. Such practices are precluded by this assurance.
6. Except as otherwise provided by law, all laborers and mechanics employed by contractors and subcontractors on all construction and minor remodeling projects will be paid wages at rates not less than those prevailing as determined by the Secretary of Labor in accordance with the Davis-Bacon Act, as amended (40 U.S.C. 276a-276a-5) and 29 CFR Part 1, and shall receive overtime compensation in accordance with and subject to the provisions of the Contract Work Hours Standards Act (40 U.S.C. 327-332); that such contractors and subcontractors shall comply with the provisions of 29 CFR Part 3; and that all construction contracts and subcontracts shall incorporate the contract clauses required by 29 CFR 5.5(a) and (c). Such contracts shall also include the applicable provisions of Executive Order 11246, as amended (Nondiscrimination in Construction Contract Employment), and the applicant shall otherwise comply with the requirements of section 301 of said Executive Order. The contractor shall furnish performance and payment bonds, each in the amount of the full contract price; and provide, during the life of the contract, for adequate fire, public liability, property damage, and workmen's compensation insurance.
7. It will provide and maintain competent and adequate architectural engineering supervision and inspection at the construction site to insure that the completed work conforms with the approved drawings and specifications; that it will furnish progress reports and such other information as the Secretary or his designee may require.
8. An assurance of compliance with Title VI of the Civil Rights Act of 1964 (Form HEW 441) applying to the facility described in this application was filed or is attached to this application.
9. It will maintain grant or loan accounting records (identifiable by grant or loan number), including all records relating to the receipt and expenditure of Federal grant or loan funds and to the expenditure of the non-Federal share of the cost of a project, for three years after the completion of the project if an audit is conducted by or on behalf of the Department within that period, or in the case where no audit is performed, for five years; except that should audit questions arise with respect to the grant or loan, the records will be maintained until all such questions are resolved. Representatives of the Federal Government shall have access at all reasonable times to the grantee's records and to work whenever it is in preparation or progress, and the contractor shall provide proper facilities for such access and inspection.
10. The facility will be operated and maintained in accordance with the requirements of

*The term Secretary or his designee shall mean Commissioner of Education with respect to Office of Education programs.

applicable Federal, State and local agencies for the maintenance and operation of such facilities.

11. The applicant will require the facility to be designed to comply with the "American Standard Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped," Number A117.1-1961, as modified by other standards prescribed by the Secretary of HEW or the Administrator of General Services. The applicant will be responsible for conducting inspections to insure compliance with these specifications by the contractor.
12. The applicant will cause work on the project to be commenced within a reasonable time after receipt of notification from the Secretary or his designee that funds have been awarded, and that the project will be prosecuted to completion with reasonable diligence.
13. Any Federal funds received pursuant to a grant or loan will be used solely for defraying the development cost of the proposed project.

Part B.

1. Hill-Burton, Community Mental Health Centers, and Mental Retardation Facilities.

a. That it will conform to all the applicable requirements of the appropriate State plan and the regulations pertaining thereto.

b. That all portions and services of the entire facility for the construction of which, or in connection with which, aid is sought, will be made available without discrimination on account of creed, and no professionally qualified person will be discriminated against on account of creed with respect to the privilege of professional practice in the facility.

c. That the facility will furnish a community service and:

(1) will furnish below cost or without charge a reasonable volume of services to persons unable to pay therefor; or

(2) will NOT furnish below cost or without charge a reasonable volume of services to persons unable to pay therefor, because of the justification which is attached.

d. The facility will be used for the purposes for which it is constructed for not less than 20 years after the completion of the construction.

2. Community Mental Health Centers:

That the services to be provided by the facility, alone or in conjunction with other facilities owned or operated by the applicant, will be made available for a program providing principally for persons residing in a particular community or communities in or near which

such facility is to be situated, at least the essential elements of comprehensive mental health services—i.e., inpatient services, outpatient services, partial hospitalization services (including at least day care services), emergency services provided 24 hours per day, and consultation and education services available to community agencies and professional personnel.

3. Health Professions and Allied Health Professions Teaching Facilities, Nurse Training Facilities, Medical Library Facilities, and Health Research Facilities.

a. The facility will not be used for sectarian instruction or as a place for religious worship.

b. The Health Professions Teaching facility is intended to be used for the purpose set forth in this application.

c. The Allied Health Professions Teaching facility or Health Research facility will be used for the purpose for which it is constructed for not less than 10 years after the completion of construction.

d. The Nurse Training facility or Medical Library facility will be used for the purpose for which it is constructed for not less than 20 years after the completion of construction.

e. The Health or Allied Health Professions Training facility or Nurse Training facility will provide for increased enrollment as set forth in the program instructions and in this application.

4. School Construction under P.L. 81-815:

a. It is a local educational agency having administrative control and direction of free public elementary or secondary education in the applicant school district, or a State agency which has the responsibility for providing school facilities.

b. It is a local educational agency created and authorized to construct and maintain school buildings under constitutional, statutory, or charter provisions; and that it may accept and disburse Federal funds to aid in financing the cost of constructing school buildings in accordance with constitutional, statutory, or charter provisions cited:

Legal Classification:

Citation:

c. The applicant has or will have title to the site or the right to build the school facilities on the site and to maintain them on the site for at least twenty years.

d. The applicant's school facilities will be available to the children for whose education contributions are provided with funds under Public Law 81-815, as amended, on the same terms, in accordance with the laws of the State in which applicant is situated, as they are available to other children in applicant's school district.

- e. The applicant will cause due consideration to be given to excellence of architecture and design of project and to inclusion of works of art the cost of which does not exceed one percent of the Federal share of the cost of the project.
5. Higher Education Facilities under Titles I, II, III of the Higher Education Facilities Act.
- a. No part of the eligible areas included in the proposed project: (1) is intended primarily for events for which admission is to be charged to the general public; (2) is especially designed for athletic or recreational activities other than for an academic course in physical education; (3) will be used for sectarian instruction or as a place for religious worship or primarily in connection with any part of the program of a school or department of divinity (as defined in P.L. 88-204); or (4) will be used by a "school of medicine," "school of dentistry," "school of osteopathy," "school of pharmacy," "school of optometry," "school of podiatry," or "school of public health" as these terms are defined in section 724 of the Public Health Service Act, or by a "school of nursing" as defined in that Act under section 843.
 - b. The applicant is fully cognizant of the requirements regarding economical methods of purchase of movable equipment in accordance with sound business practice, as set forth in the applicable regulations, (45 CFR 170.4), and all movable equipment, the cost of which is to be charged to the project, will be procured in accordance with such regulations. It is understood and agreed by

the applicant that the eligible project development cost and the Federal grant or loan amount may be reduced at settlement by the Commissioner of Education based on the amount of any costs claimed under the project which are for elaborate or extravagant equipment items.

- c. It is understood and agreed by the applicant that the Commissioner of Education may, from time to time, after execution of a grant or loan agreement for the project, and prior to final settlement under the grant or loan agreement, make downward amendments in the grant or loan amount to adjust to a reduction in the cost of the facilities, the identification of ineligible costs, or a reduction in the size of the project.
- d. The applicant has reviewed the academic and financial requirements for operation of the facilities upon completion, and considers the plans for operation of the facilities to be practical and within the financial capabilities of the institution.
- e. The facility will be used as an academic facility for not less than twenty (20) years after completion of construction (unless otherwise approved by the U.S. Commissioner of Education), or for so long as the Government holds any of the bonds pursuant to a loan from the Government, whichever is longer.

20. CERTIFICATION BY APPLICANT

The applicant hereby certifies that the foregoing information in this application (including all assurances and all attachments) are correct to the best of its knowledge and belief.

Regents of the University of Minnesota

Morrill Hall, Minneapolis, Minnesota

(Legal Name of Applicant)

(Address)

Clinton T. Johnson

(Address if different than above)

Clinton T. Johnson, Assistant Vice President,
Business Administration & Treasurer

March 17, 1975
(Date of Application)

(Typed Name and Title of Authorized Officer)

James F. Brinkerhoff, Vice President for Finance, ~~Planning and Operations~~

Special Funding Consideration

Category #2

Salvage Projects

- a) There is clear and unquestionable evidence that the facilities to be replaced are so obsolete that a substantial curtailment of enrollment or deterioration of the quality of the educational program will occur if facilities are not replaced - see pages 32 and 133.
- b) Alternative solutions before replacement of facilities have been actively and fully pursued and found to be unavailable or unsatisfactory - see pages 32 and 138.
- c) There is full expectation that on completion of the single replacement project the institution will sustain a stable financial operation that will not require undue dependency on Federal support - see page 129.

ABSTRACT OF THE PROPOSAL

Background

In 1964, the Health Sciences units at the University of Minnesota began a comprehensive study of long-range development of programs and facilities. The Master Plan, developed for facilities in response to the integrated relationships of the programs includes long and short term expansion providing physical and curricular integration among Health Sciences units and with other elements of the Minneapolis campus.

Basic construction of Unit A of the Health Sciences Expansion was completed in the fall of 1973. Health Sciences students began utilizing finished portions of the facilities in the 1973 fall quarter. Sixty percent of Unit A is devoted to facilities for the School of Dentistry with the remaining forty percent being utilized by the Medical School and its Health Sciences shared space for seminar rooms, educational systems facilities, classrooms/lecture rooms, and teaching space for the Basic Health Sciences.

Unit B/C (currently under construction) is a planned expansion of the Unit A concept with primary amounts of space being allocated to the Medical School and outpatient departments.

Unit F (the subject of this application) will house the College of Pharmacy and the School of Nursing and together with Units A and B/C, physically and functionally constitute a fully integrated facility for health sciences education. Unit F will complete the total Health Sciences major new construction. The University's concomitant plan for major enrollment increases has resulted in a total health science enrollment in Medicine, Dentistry, Nursing, Pharmacy, Public Health and Allied Health of a current study body of 4,557 compared to 3170 in 1969. Further increases over the next several years resulting from the full impact of larger previous years first-year enrollments and the commitments attendant to this request for Unit F.

Student Enrollment

As part of pharmacy's commitment to the project and manpower needs, the first year enrollment will be increased from the present level of 123 to 172. The current enrollment figure, which has been generated through anticipation of expanded facilities, is taxing present facilities (which were originally intended to accommodate a maximum of 80 students per class). Most of the enrollment increase will be in an expanded Doctor of Pharmacy (6 year) program.

Proposed Facilities

Unit F will consist of eleven floors of space located directly north of and adjoining Unit A. Three levels are below grade with the remaining eight floors above grade. The building will house the College of Pharmacy and School of Nursing in toto, with the exception of certain clinical functions which will remain with affiliated institutions. Through Unit A, Pharmacy will have direct accessibility to the remainder of the Health Sciences Center, including the Bio-Medical Library.

The building will have an assignable net square footage for the two programs of 111,584. The Pharmacy program requires 50% of the total assignable square feet or 56,384 n.s.f. The remaining portions of net assignable square feet will house the School of Nursing program and classroom, auditoria and other spaces designed for sharing by all health science students in accordance with the concept of the Master Plan and implemented in Units A and B/C.

The dollar magnitude of the Unit F project is approximately \$20,948,938. The federal participation being requested is \$4,395,412 for Nursing and \$4,823,761 for Pharmacy.

Need for Additional or Improved Facilities

The College of Pharmacy's need for Unit F is expressed in three categories: (1) to maintain present enrollment and/or to accommodate increased enrollment; (2) new programs; and (3) replacement of inadequate facilities.

1. Enrollment.

The College is in a facility which was meant to accommodate entering classes of B.S. candidates of 80 students. Consistent with plans to supply the needs of the State and to coincide with quality programs that could be handled in the proposed facility, the size of the entering class has been expanded to 123 students. The new professional Doctor of Pharmacy degree program has 25 students. This is considered under new programs. The graduate program has expanded from the 25 students that could be handled in the present facility to 66 at present. The College faculty insists that the present high quality of program not be comprised. Without the new facility, the first year enrollment in the B.S. program will be decreased from 123 toward 80, the Pharm.D. program will not expand at a very critical time and the graduate program will have to be significantly reduced.

2. New Programs.

a. Doctor of Pharmacy. The third class will graduate from this program in June, 1975. The entering class has increased from 8 to 15

students. There is a demonstrated need for these specialized pharmacists and a great demand from students for the program. As a part of the plan for the new facility we intend to increase the enrollment in this program by 49 students to assist in fulfilling the needs of states in the greater upper midwest. It is proposed that a selected number of students from Montana, North Dakota, South Dakota, Wyoming, Colorado, Iowa, and, possibly, Wisconsin and Nebraska be admitted. These states do not have programs presently and, in some cases, the overall health science support to mount such programs. However, the expansion of our program cannot be handled successfully with present facilities. This approach is consistent with programs between the School of Medicine and School of Dentistry with some of the states identified.

b. Pharmacy Administration Graduate Program. This program is new in the College but is growing rapidly because of the excellence of the program plus the supporting educational resources available at the University of Minnesota. The need for graduates is very great in this field as there are only a few such programs in the country. Growth in demand is virtually assured. A Center of the Study of Pharmaceutical Systems is a part of this program. The limited facilities available block further growth.

c. Interdisciplinary Programs. Teaching programs that will fully achieve the Health Sciences objectives of interdisciplinary training and development of the team approach to health care delivery have not been possible in the inadequate, obsolete and crowded existing facilities. The addition of Unit F to the completed Unit A and Unit B/C which is under construction will provide the necessary components for bringing learning experiences that represent the proven economics and positive advances in instruction through the use of technology. Innovative and new approaches to learning experiences and educational planning will increase the educational effectiveness of the Health Sciences faculty. The facilities will make it possible to improve the utilization of new instructional technology by virtue of a network of audio-visual hardware, a process of providing educational development.

3. Replacement of Inadequate Facilities.

Every effort has been made to maximally utilize the renovated School of Mines building that now houses a part of the pharmacy program, Appleby Hall. Classrooms and storerooms have been converted to laboratories. Corridors have been closed off to provide offices. Despite this, the College has completely outgrown the facility -- which is located a distance from the Health Sciences Center. As a result, the University System's Drug Information and Education Program is mostly housed in Elliott Hall, two faculty have laboratory-office space in the School of Medicine, several clinical faculty members have their main office at the affiliated institutions some distance from the campus, and an all apartment building has been renovated to house the Doctor of Pharmacy students and program, the Pharmacy Administration staff and graduate programs, the staff of the program of Continuing Pharmacy Education, and a segment of the College administration. The situation is worse than in 1972 when the accrediting agency, the American Council on Pharmacy Education, recommended the need for more adequate facilities.

Summation of Responses to Construction Assistance Evaluation Criteria

Reference: Page 37, 195.

1. Effectiveness of the project to provide increased training opportunities:

RESPONSE: The most acute shortage in pharmacy personnel today is in the area of the clinical specialist. This University of Minnesota college is the only one in the upper-midwest with an active professional Doctor of Pharmacy program. The out-of-state enrollment into this program is being maintained at one-half the entering class. Applicants far exceed the capacity to admit them. Funding of this project will allow for an increase in Pharm.D. capacity from the present 25 to 75. The 40% increase projected for this facility (123 to 172) will be made through increases in the Pharm.D. program. The college will offer opportunities to other states to send selected students to our college for the Pharm.D. program. The University has precedence for this in that the School of Medicine has agreements with North and South Dakota, the School of Dentistry with Montana and North Dakota and the School of Veterinary Medicine with Wisconsin and, soon, Nebraska. The states under consideration for our program are Montana, Wyoming, North Dakota, South Dakota, Colorado, Nebraska, Iowa and Wisconsin. None of these states have Pharm.D. programs although Nebraska and Wisconsin have them under consideration at this time. There is adequate time to work out admission details with the start of construction of Unit F.

Reference: Page 195.

2. Effectiveness of the project in accomplishing the purposes of the programs at the least relative cost to the Federal Government.

RESPONSE: This facility for joint use by pharmacy and nursing is a part of the planned expanded Health Sciences Center. Additional facilities for dentistry and medicine have been occupied or are under construction. The shared classroom space in this immediate area that is completed is in constant use. The facility under consideration has a somewhat higher than usual construction cost due to the tied-in site and the very flexible design established for the entire Center. A special effort has been made to assure maximum usage of the facility. This is particularly true of much of the area to be shared by nursing and pharmacy. For this application, the college is requesting a minimal 50% federal match for that portion of the building necessary for the College of Pharmacy program. The remainder of the funds will come from private and State sources. Evidence of State of Minnesota support for the College of Pharmacy project is evidenced by the appropriations noted on page of the HEW form 537. The State Legislature provided funds in 1969 for planning and working drawings for the entire Health Sciences project of Units A, B/C and F. In 1971 over \$1 million was appropriated for land acquisition and program planning for Unit F.

The proposed expansion was carefully scrutinized by the Board of Regents, the Metropolitan Council ("B" Agency), the State Comprehensive Health Planning Agency ("A" Agency) and State legislative committees. It is considered to be the least costly alternative which would fulfill the specified requirements. The current proposal providing facilities for nursing and pharmacy is the result of several years of investigation, planning and discussion with official groups within the state.

Reference: Page 133.

3. Extent to which the project may be instrumental in stabilizing institutions who are in precarious circumstances.

RESPONSE: Although financially stable, the College of Pharmacy at the University of Minnesota must have additional space which will meet the demands of more students, additional faculty, expanding programs, and an environment where the concept of the interdisciplinary health care team can be achieved. It has been necessary to renovate an old apartment house several blocks from the present college facility for faculty and graduate student use. Other faculty members have found it necessary to establish their offices in the affiliated institutions. All but one classroom in the present pharmacy facility have been converted to office and laboratory space. This is no longer adequate as considerable crowding does exist. While we have been able to maintain the quality of our program as attested to by a recent fifth ranking in United States pharmacy schools, we are experiencing difficulties which are due directly to inadequate facilities. The new facility would counter this trend and greatly strengthen interdisciplinary education and relationships in the Health Sciences Center. It needs to be emphasized that, despite the fact that the college has been housed in facilities built for other purposes since 1892, the faculty declined an addition to its present building because of the considered importance of the development of the health team concept which requires the college to be located in close proximity to the other units.

Reference: Page 129.

4. Availability of resources to operate the program over useful life of the facilities.

RESPONSE: There is no doubt that resources will be available to operate the new facility over its useful lifetime. Conservative budget figures are found elsewhere in this application. These were prepared by the Office of the Vice President for Finance and are based on simple trend extrapolation. The statements of Income and Expenditures show four recent years of a long history of growing resources. The magnitude of current growth serves as a resource base for the future and provides adequate verification of the University's ability to provide the necessary resources to operate the project.

The administration of the University, the Board of Regents, and appropriate legislative committees studied and concurred in the planning for this Phased Project. The faculty, many of whom have national and international reputations of competence in their fields, attract substantial support and resources from outside the University.

Reference: Page 182.

5. Effectiveness of the planned utilization of the proposed facility.

RESPONSE: Utilization of Unit F incorporates elements of education in all academic units of the Health Sciences. This interdisciplinary use of the facility with units of the Learning Resources Center, auditoria and classrooms, etc., will enable more complete utilization of teaching space and interdisciplinary collaboration not possible in existing or single purpose facilities. Perhaps, very important is the fact that nursing and pharmacy programs emphasize the use of small group facilities which have been incorporated into the design.

Development of this facility in close proximity to the laboratory, x-ray, dental and other clinical educational and technological resources of the University Hospitals. Medical School facilities provide a rich and economical setting for exemplary clinical training. In addition the extensive media resources of the entire University campus, are to be tied in with the media systems in the proposed plan through the Health Sciences Center. These are to be used for continuing education of pharmacists, nurses, physicians and other health science workers, alone and together, in addition to their primary use in undergraduate and graduate pharmacy and health science education.

To effectively provide for accessibility to these health care facilities, planning coordinated with appropriate metropolitan and State agencies led to the construction of a 2000 automobile Health Sciences Parking Ramp with direct access to and from Interstate Freeway 94. This facility is presently open for use.

Reference: Page 97.

6. Effectiveness of the project to achieve a more equitable regional and national geographic distribution of training opportunities for qualified applicants.

RESPONSE: A special attempt will be made to prepare students at the Pharm.D. level especially for those states in our region who do not have the supportive health professional units to accomplish such programs in the near future. It is anticipated that we will accept limited numbers of students from North Dakota, South Dakota, Montana, Wyoming, Colorado, Iowa and, possibly, Wisconsin and Nebraska. We will continue to develop Clinical Pharmacy faculty members for other pharmacy schools where demand continues strong (over 100 openings for the coming academic year).

The programs in the College of Pharmacy are associated with the Area Health Education Center (14 counties in Central Minnesota), the Rural Pharmacy Associates Program, and preceptorships where practicing pharmacists reach out into the region for educational experiences for students and faculty. The Learning Resources Center of the Health Sciences Center will function with the pharmacy unit to provide self-instructional materials for students and pharmacists in these decentralized areas.

The College of Pharmacy regional relationship with the medical schools of the University of Minnesota at Duluth, and the Mayo Medical School in Rochester are contingent on appropriate support facilities for the development of divisions of the College at these sites to influence the development of health team approaches at these sites. The success of these programs depends in large measure on resources of the College of Pharmacy to provide the depth of instruction in subject fields not sufficiently available or represented in such areas.

Reference: Page 136.

7. The effectiveness of the current utilization of present facilities by the applicant.

RESPONSE: Current available health science educational facilities are over-utilized and will be until such time as the facilities expansion is completed. Construction time tables developed in the master plan are several years behind schedule and have not kept pace with enrollment increases. Crowding and inefficiency are especially evident in the College of Pharmacy and its teaching programs. The necessity for assignment of several teaching faculty members, students and support personnel to space off-campus and the "make-do" program of utilization pending completion of new and expanded facilities have created significant logistical problems.

The main pharmacy facility, Appleby Hall, has only one functioning lecture room remaining. All other lecture rooms have been or are being converted to laboratory space for pharmacy programs. Graduate student and research space is inadequate. Some faculty are in another building in the Department of Pharmacology. The Drug Information and Education Program is partially housed in Elliott Hall. The learning resources center is housed in a former stockroom without adequate space for study carrels. An apartment on the site for Unit F construction has been renovated for temporary relief of space problems.

Reference: Page 139.

8. Effectiveness of the consideration and selection of alternative means for consummation of the project resulting in lower cost with minimum compromise of scope or quality. (Includes extent and fit of area master-planning, consideration of affiliation or consortia agreements, etc.)

RESPONSE: As a pioneer in the development of the clinical component of pharmacy education, the faculty of the College of Pharmacy in 1967

rejected an addition to the present facility because of the poor location with respect to other units in the Health Sciences. Planning which was started in 1964 led to consideration of a number of alternatives for all the health units. However, the decision of the University Administration, the Board of Regents and the State Legislature was to construct a Health Sciences Center that would have the greatest efficiency and flexibility and assure a continued quality of education. With the completion of Unit A and the construction of Unit B/C, a part of our program is already housed in the center in such areas as shared classrooms, learning resources, health profession continuing education, etc.

The University has publicly supported the Health Chapter of the Metropolitan Development Guidelines and the planning for health care delivery undertaken by the Health Board of the Metropolitan Council.

The University participated in and partially financed the activities of the Hennepin County Health Coalition, a planning and coordinating group to encourage availability of care at acceptable costs.

Experience with alternatives to centralized clinical instruction are both necessary, to accommodate larger numbers of students, and important in broadening the bare clinical exposure. Even so, these opportunities do not substitute for the necessity of maintaining a core educational unit, the Health Sciences Center including Unit F, where experienced instructional technologies are preceded by a full time faculty. This cannot be duplicated at other sites where the primary mission is patient care without substantially increasing costs and requiring significant enlargement and duplication of full time faculty and other necessary resources for education.

Reference: Page 117.

9. Impact of the project on supporting the applicant's efforts in providing more opportunities for students from under-represented segments of the population.

RESPONSE: Completion of this project will have a significant impact on efforts to provide more opportunities for students from under-represented segments of the population.

The number of women admitted to the Pharmacy college has been increasing annually for the past several years and has reached about 40%. With the incoming class of 123 for academic year 1975-76 now half filled, the percentage of females is in excess of 50%.

Student selection at the University of Minnesota has always maintained a good geographic balance, with about half of the students being selected from out-state areas, and half from the urban area. The resulting study body in Pharmacy has resulted in a minimum of distribution problems for pharmacy practitioners.

The predominant minority group in Minnesota is the American Indian. Despite the fact that the Health Sciences Center has a special project for the identification, orientation and selection of such minority students, our success has been limited. This is due, in part, to the attraction of medicine or dentistry for qualified students.

On the Minneapolis campus, the Office of Health Sciences Opportunities in Health for Minority Students provides a program to enhance minority students' interest in entering the health fields, and to counsel and assure quality preparation for admission to the Health Sciences educational units. The admission policy of all Health Sciences units encourages the admission of minority students to achieve substantial minority representation in each class. Since minorities in Minnesota's population are less than this goal, recruitment reaches beyond the state to the region and the Nation.

A recent review of the Health Sciences efforts has resulted in a favorable evaluation of past efforts and the preparation of a long-term plan that may well improve the results.

Reference: Page 99, 103, 114.

10. Impact of the project in supporting educational programs which are designed to promote the effectiveness of health care delivery--e.g., through introduction of interdisciplinary team approach methods, clinical community out-reach programs, etc.

RESPONSE: The College of Pharmacy has been and continues to be effective in the development of out-reach programs for education and service. As detailed elsewhere they include:

- Area Health Education Center Programs
- Rural Pharmacy Associates Program
- Rural and Urban Externship Programs
- Affiliated Hospitals
- Nursing Homes
- Learning Resources Center at Fergus Falls
- Community-University Comprehensive Health Center
- Unit B/C Outreach Clinic
- Stillwater State Prison Program
- Anoka Mental Hospital Program
- Community pharmacies

In these programs, interdisciplinary team approach methods are stressed as well as the exposure of the student to the community environments.

The College's Drug Information and Education Program was one of the first successful efforts at interdisciplinary education for health science students. The initial courses in Drugs and Society have been added to as the Health Sciences Center administration seeks ways to increase the interdisciplinary efforts of students through courses and out-reach experiences.

The program has gone beyond the Health Sciences Center in its efforts to bring together providers and consumers of information on drugs. This unit is presently housed outside the Health Sciences Center. It will be more efficient within the Health Sciences Center in close proximity to the Colleges Drug Information Center which serves health professionals all over the State.

The strengthening of core educational resources will also provide the necessary increased educational support to existing and expanded clinical training in affiliated community health resources.

New programs relating to more effective health care delivery, such as for nurse practitioners and clinically oriented pharmacists, have been initiated but cannot be appropriately integrated into clinical instruction because of the space and design limitations of existing facilities.

Reference: Page 102.

11. Relative emphasis of the project in affecting the distribution of program output into areas of critical health manpower needs.

RESPONSE: One of the very significant needs in health care is a professional whose principal role is drug-use control. The College of Pharmacy programs are designed to meet this need. At the B.S. level students are prepared to serve the patient and the other health professionals as therapeutic consultants to an ever increasing extent. Nevertheless, the most striking affect will be on a more sophisticated level involving graduates with Pharm.D. degrees. We have been experimenting with role model development for the Pharm.D. as the "applied clinical pharmacologist". It is expected that there will be a very great demand for this type of person in every hospital and organized health care (i.e. Health Maintenance Organization) in this State.

The College of Pharmacy recognizes its responsibility on a regional basis as well and proposes to accept students from the states of Montana, Wyoming, Colorado, North Dakota, South Dakota, Iowa and, possibly Wisconsin and Nebraska for education at this level because resources do not exist for the initiation of such programs there.

The College of Pharmacy is also experimenting with the Pharm.D. in primary care as it applicates to rural and underserved urban areas. Results are encouraging and suggest a considerable impact on health care in these needy areas.

Reference: Page 104.

12. Relationship and compatibility of the project to state, regional or area plans for health manpower training as they related to health care delivery needs.

RESPONSE: The Unit F project has been thoroughly discussed with and reviewed by the appropriate agencies responsible for planning of health care facilities and delivery systems in Minnesota. Letters of support from the State Comprehensive Health Planning Agency ("A" Agency), the Metropolitan Council's Health Board ("B" Agency) and the State Planning Agency (A-95).

In recent years, the University of Minnesota Health Sciences Center and its units have provided talented, experienced leadership and educational resources for Northlands Regional Medical Program, an important agency for health manpower training in Minnesota. The University is also the sponsor of an area Health Education Center, which provides valuable training programs and educational expertise for health manpower training and improved health care delivery in Comprehensive Health Planning, Area D, a large 41 county region in north and central Minnesota.

The University has conducted, since 1971, the Rural Physician Associates Program, a unique, nationally recognized 9 to 12 month preceptorship program for 40 third-year medical students participating effectively in rural health care delivery. In 1975, the Rural Pharmacy Associate Program will be implemented with 20 fifth-year students. While providing direct health care services in rural communities of the state, these medical and pharmacy students will develop associations which may lead them to establish team practice in non-urban communities calling for additional primary care services. Unit F will accommodate clinical faculty support for this program as well as educational resources necessary to accomplish programs at non-University sites.

The expansion of the Pharm.D. program will make possible the training of pharmacy students from other states in this area that do not yet have the resources to develop such programs. In several of the states the supporting health professions educational units do not exist.

Reference: Page 114.

13. Effectiveness of the project in promoting broad health objectives-- (area health education centers, health maintenance organizations and regional medical programs) and affiliation agreements with other educational and community institutions.

RESPONSE: The construction of the facility will provide the base from which additional broad health objectives may be pursued. Space for the provision of basic and initial clinical training of larger numbers of pharmacy and other Health Sciences students provides the framework for subsequent exposure and training in a variety of health service resources, educational opportunities in these resources reflect exposure to delivery alternatives and efforts toward influencing the selection geographical practice location in areas of health manpower need. Current health science teaching affiliations exist with over 100 metropolitan and rural health service resources. Up to one-half year of clinical pharmacy education in rural communities is available to pharmacy students and rural clinical training is also available to the schools of Nursing, Dentistry, and Medicine. This core facility will enable basic educational resources, e.g., Learning Resources Center, capabilities to serve and enhance a broader exposure and the promotion of a variety of delivery alternatives through enrollment expansions.

Reference: Page 97.

14. Effectiveness of the project in promoting the training of personnel in current shortage skills and disciplines, e.g., primary care physicians and dentists, clinical pharmacists.

RESPONSE: The clinical pharmacy program at the College of Pharmacy is extensive and impressive. The projected program is even more extensive and exciting. The 40% increase in enrollment will be restricted to the Pharm.D. program where the greatest need is expected. Students for the Pharm.D. program will come, in part, from states in this region where no such programs exist or are planned. Our best estimate suggests that before the end of the decade and soon after the building is occupied, the demand will far exceed our ability to prepare Pharm.D.'s

The need for a significant effort in retraining of the practicing pharmacist in the clinical area must also occur to improve health care to the patient.

Reference: Page 37, 38.

15. Effectiveness of the project in consummating an enrollment increase in the least amount of time.

RESPONSE: The 40% increase in enrollment is planned for the first year of occupancy. It is planned that this will occur through agreements with several states that will permit the Pharm.D. training of a very limited number of their residents in the Minnesota program.

Item 7 -- APPLICANT ELIGIBILITY AND NEED FOR FACILITY

This application seeks funds for construction of Unit F (College of Pharmacy and School of Nursing) of the University of Minnesota Health Sciences expansion program. Unit F is the third step in this program to request federal funding. Unit A (Dentistry and Basic Health Sciences) and Unit B/C (Medical School and outpatient facilities) have been awarded funds. An application for Unit F (Pharmacy only) was previously submitted on June 30, 1971, June 15, 1972, and April 1, 1974, and although on all three occasions the applications received the approval of the National Advisory Council, the first two attempts were not funded because of insufficient monies in the respective funding cycles and the third attempt, which was minimally funded (approx. \$1 million), was not accepted by the University of Minnesota because of the inability to make up the difference between the amount requested and the amount of \$\$ made available.

Application is being made under Category 2 -- Salvage Projects.

Salvage Projects:

- (a) There is clear and unquestionable evidence that the facilities to be replaced are so obsolete that a substantial curtailment of enrollment or deterioration of the quality of the educational program will occur if facilities are not replaced.

See pages 32, 133.

- (b) Alternative solutions before replacement of facilities have been actively and fully pursued and found to be unavailable or unsatisfactory.

See pages 32, 138.

- (c) There is full expectation that on completion of the single replacement project the institution will sustain a stable financial operation that will not require undue dependency on Federal support.

See page 129.

Accreditation:

The accrediting agency for schools of pharmacy is the American Council on Pharmaceutical Education. The last accreditation examination of the College of Pharmacy took place on January 29th and 30th of 1973. Re-examination of each accredited school normally will be made at least once every six years. A copy of a letter signifying accreditation at the last visit and a letter of reasonable assurance of continued accreditation are attached.

Action and Recommendations of the American
Council on Pharmaceutical Education*

The report of the examination of the University of Minnesota College of Pharmacy for continuation of accreditation by Council representatives A.G. (Mike) McLain and Melvin W. Green on October 11-13, 1972 and communication received from the institution relative thereto were duly considered at a meeting of the American Council on Pharmaceutical Education held in Chicago, Illinois on January 29-30, 1973.

Following a discussion of the elements of strength and weakness of this College and its program, it was the decision of the Council that this school complies with the standards of the Council and that it should be retained on the list of accredited colleges of pharmacy to be published July 1, 1973. It is expected that annual reports to the Council will continue to show progress in the various phases of the program of the College of Pharmacy.

In view of the apparent progress that is being made toward more interdisciplinary instruction at this College, it is the hope of the Council that ways will be found to make it possible for the College of Pharmacy to relocate on the health affairs campus in the not too distant future.

Fred T. Mahaffey, Secretary
American Council on Pharmaceutical Education

*Note: The signed original is available in the Office of the President, University of Minnesota.

THE AMERICAN COUNCIL ON PHARMACEUTICAL EDUCATION

77 West Washington Street

Chicago, Illinois 60602

312/263-6540

February 11, 1975


Dr. Lawrence C. Weaver, Dean
University of Minnesota
College of Pharmacy
Minneapolis, Minnesota 55455

Dear Dean Weaver:

I am pleased to supply a letter of support for a construction grant for a new pharmacy facility. The College of Pharmacy was last evaluated for continuation of accreditation in October of 1972, and was subsequently granted full accreditation status. However, the evaluation team report cited the need for improved physical facilities due to the expanded needs of the programs in pharmacy. Of great significance was the recommendation that the professional programs leading to the baccalaureate and doctorate in pharmacy with their necessary clinical components, would not reach full effectiveness without being located in the health affairs area of the campus. It is clear that the progressive and constructive professional leadership of the college is only impaired by lack of adequate space, coupled with the need to better interface with other health professions.

With this background information, reasonable assurance with respect to this grant application and its relationship to continued accreditation can be offered. Indeed, compliance with standards of the American Council on Pharmaceutical Education as effective July 1, 1974, requires demonstration of a broad range of essential resources including teaching and research facilities in the college as well as adequate faculty and staff offices.

Sincerely yours,



Daniel A. Nona, Ph. D.
Director of Educational Relations

DAN:eil

Need for Additional Facilities and Basis for Decision:

Background -- For more than a decade, the faculties of the University of Minnesota Health Sciences have carefully considered objectives and programs for the future. Paramount in these discussions and decisions has been the recognized desirability and need for greater interaction between the various disciplines within the Health Sciences not only in the learning environment but also in the service environment.

After extensive deliberation, the faculty of the College of Pharmacy published a report entitled "Future Planning for the Health Sciences -- Pharmacy" on January 19, 1967. The conclusion of the study was that "the College of Pharmacy must become an intimate part of the Health Center Complex with regard to academic programs and to location". The following reasons supported this decision:

1. The curriculum is becoming biomedical in its orientation. Many of these needed offerings must come from the College of Medical Sciences.
2. For the pharmacist and other health professionals to attain the interprofessional relationships necessary for an integrated approach to the health care needs of the community of the future, we must develop the means for student exposure and cooperative effort. In the comprehensive clinic, it would be possible for the student pharmacist to work with the medical student, the dental student, and/or the student nurse. He should be exposed to coursework with these other professionals whenever possible.
3. While there are obvious minor disadvantages associated with a change in location insofar as our graduate program is concerned, there are also some advantages. Federal grants for research equipment could be procured more readily if several departments, including the College of Pharmacy, Departments of Pharmacology, Biochemistry, etc., would submit joint proposals. Such an arrangement presently is not readily attainable due to the physical distance between our present facility and the medical complex. Another plus feature would be the greater collaboration in research between the College of Pharmacy and the Medical School.
4. As the state's major health training center, future programs involving pharmacy should be investigated and developed or rejected here after discussion by all areas of health sciences (i.e., central drug information source).
5. More effective continuing education programs may be developed for health interprofessional use. This represents a big task for all professionals which must be attacked on a broad front. Since pharmacists and other health professionals work together in practice, these programs may be more expeditiously developed within the framework of a cooperative health sciences group.
6. We need the facilities of the hospital and student health center as teaching areas for our programs in clinical pharmacy. Students must work in the patient-care environment studying the patients' charts, their drug history and records, and all of the collateral data which are a part of modern therapy and, all the while, reacting with other health science students (dental, medical, and nursing).
7. Opportunities for the development of integrated multi-level courses and advanced teaching techniques should be enhanced because of greater resources .

This decision to become an integral part of the Health Sciences Complex precluded the proposed building program for the College of Pharmacy which was a part of the University's 1967 priority planning. This proposal for an addition

to Appleby Hall (the present facility) would have provided the space needed for present physical deficiencies but would not have corrected deficiencies which have come about because of needed changes in the pharmacy curriculum and the profession of pharmacy itself.

Throughout its 83 year history, the College of Pharmacy has never been housed in facilities designed specifically for its use. Appleby Hall, the former School of Mines building, was originally built in 1915 and was renovated in 1959 for pharmacy's use. Conditions were considered crowded almost at the time that it was occupied. The University's building program included a wing for this facility for 1967; however, as stated above, the College faculty asked that this plan be delayed in order for them to complete a study of the future of pharmacy and pharmacy education. This study resulted in the recommendation that the College could best prepare future pharmacists in an environment where all the health sciences were represented. This apparent sacrifice is still supported by the faculty of this College.

Deficiencies of Existing Facilities -- Appleby Hall has served as the pharmacy facility since 1959. However, crowding was making normal operations very difficult. Early in 1974, a decision was made to convert an old apartment house (Fenwick) near the Health Science Center main facilities to offices for faculty and graduate students of the non-laboratory discipline. The movement of a part of the faculty to this site was accomplished early in the 1974-75 academic year. The quality of Fenwick requires that it be considered temporary since it is scheduled for demolition before the end of the decade. After only a rather brief period of separated faculty, we are experiencing the great disadvantages of housing faculty members residing at more than one site (many of the clinical faculty members have as their main office, the affiliated institution where they do carry out their education and service functions). We are experiencing communication problems despite our efforts to prevent them. This comes at a time in our program planning when integration and the development of the "Student as Learner" concept has gained faculty support.

It is a distinct credit to this institution and its College of Pharmacy faculty, staff and students that they have been able to develop one of the top programs in U.S. Pharmacy schools (Rating #5, Change/Winter 1975). This has been accomplished in facilities which must be considered the most inadequate of the ten top rated schools. This is not the primary concern of this faculty. The primary concern is whether we can even maintain the quality of education. Like many other health professions schools, this College has increased enrollment as a requirement for Federal capitation funds which have been so very important in the development of our pharmacy programs. In addition, we have accepted bonus students as a part of a plan to fulfill our obligations on enrollments when the proposed new facility was completed. In retrospect, this seems justified in that the three previous applications for construction funds all received approval and recommendations for funding. In 1974, \$1,061,361 was offered the College for construction. The amount was inadequate and it was necessary to reject the offer. Nevertheless, as a result of these requirements to increase enrollment we have a student body that is about fifty percent larger than is considered maximum for this facility. If a new facility is not realized very soon we will find it necessary to decrease enrollment or accept that the quality of our programs will suffer. It is not in the best interest of the people of Minnesota and the upper midwest for either to result.

Appleby Hall fails to serve our needs in a number of ways that we will try to detail. Considerable curriculum changes have given our programs a strong patient orientation. We must have students in the patient care

environment and in contact with other health students to develop interprofessional relationships during the academic years and to provide an opportunity to experiment with health care team approaches. To make this relationship successful, the health faculties of all units must be involved; this is not possible in our present facility. We must have the components necessary to continue leadership in the development of new health care systems.

The present facility is inadequate for the programs currently being administered. At the time when Appleby Hall was converted to pharmacy use, it was projected that we would have a maximum of 80 students per class. This projection has not been adequate for quite some time to meet the needs of the State. As a result, academic programs have been arranged to permit larger classes which will come closer to providing the State's needs.

With the shared classroom space in the Health Science Center becoming available this year, we have converted all the space in Appleby Hall available into laboratory facilities for faculty and students. There is only one classroom remaining in Appleby Hall. We have only one small conference room in the facility. Thus, most lectures for pharmacy students, conference, committee meetings, and seminars are held around the University---or in a laboratory. Even with the conversion of space to laboratories we find crowded conditions compromise the maximal environment needed for productive work. Several faculty members (with established research records) are without their own laboratory.

The planned specialization programs for Pharm. D. (notably the applied clinical pharmacology option) requires additional pharmacotherapeutic laboratory space. It may prove necessary, and may be even desirable, to establish such laboratories in affiliated institutions. It seems unlikely that space can be found to accomplish this in Appleby Hall.

The editorial offices of the Journal of Medicinal Chemistry, which recently were awarded to the College, are being housed in a portion of the manufacturing suite. Another portion of the manufacturing suite is being utilized as offices, graduate student work space, and as a make-shift learning resources center. The latter inadequacy has an important negative impact on faculty development of improved teaching methods. Frankly, our Learning Resources Center cannot be expanded into an operational unit in this facility. It will continue to be an experimental unit only. This inadequacy will affect the success of our self-paced learning approach to education.

The medicinal chemistry undergraduate laboratory, with 80 benches and an attached 'balance' room was designed to hold 2 sections of 40 students at alternate times and was intended for a more or less traditional 'wet' laboratory type of operation in which little or no modern instrumentation was used and almost exclusively, experiments dealing with gravimetric and/or volumetric analysis were taught. Enlargement of classes beyond 80 to the present 120+ resulted in inadequacy of desks and a complicated and unsatisfactory system of supplying students' needs arose even though additional sectioning was possible. Recognition of the need to modernize the analytical offerings by adding instrumentation already commonly used in even smaller pharmaceutical analysis laboratories complicated the situation both as to space and time needs. This situation has not been adequately met due to the outmoded facilities. Similar situations exist with other undergraduate laboratories.

Graduate student space is often more crowded, with essentially all available spaces being assigned and some being jointly shared by graduate students,

technicians, and post-doctoral fellows. Although this lack of space quantity is critical, the lack of space quality is even more critical.

Appleby Hall, a former School of Mines building, was not designed for biological research and essentially every set-up has to be compromised because of it. This is especially noticeable as graduate and research programs become more biologically oriented. It has been necessary to block off portions of the Medicinal Chemistry graduate suite to provide space for work associated with tissue culture and biological systems. Likewise, it has been necessary to convert one of the stockrooms to biological usage. More recently we have acquired a classroom which will be converted to biological research as we have not found chemical and biological research in the same laboratory very compatible. In doing so, we have experienced numerous difficulties and excessive expenditures because the facility was never intended for this type of use.

Relatedly, the minimal animal facilities which are available fall far short of meeting our needs. It is practically impossible to maintain any large animals for other than short periods. Since we are physically removed from more adequate animal space in the Health Science Center, we compromise education and research.

Small group interaction space is at a premium. The only space conveniently utilizable is the conference room associated with the college administration suite. As the presentation of more and more classes tend to lean in this direction, more space will have to be generated for this type of utilization; and unfortunately, the further away these interactions are from the College, the less effective they tend to be. Seminar space poses the same problem. At present, several of the undergraduate laboratories are being utilized for seminars and small groups when not in use by the department -- although acceptable due to lack of other facilities, they fall short of providing optimum conditions and support for these functions.

An increased interest and emphasis in innovative teaching methods and hardware has been shown by the faculty during recent years. For several years we have experimented with programmed instruction approaches as well as with various audio-visual aids, particularly television. This most certainly will increase as the success of the courses being taught using these methodologies has been extensive. The present facility was not designed for the kind of instruction we foresee as being applicable to pharmacy education. The present library facilities inhibit student use as it doubles as a reading and a studying area as well as the librarian's office. In addition, the minimal learning resources space we do have doubles as a faculty member's office, compromising both functions.

Continuing education has the same quantity and quality of space problems as do the undergraduate, graduate, and research programs.

As a result of the current critical situation, the Department of Clinical Pharmacy and the Graduate Program in Pharmacy Administration have moved to separate facilities in the summer of 1974. These facilities are approximately six blocks away from Appleby Hall. It should be pointed out that the space in Appleby Hall that will be vacated is so minimal that only a portion of the remaining space needs were relieved. This separation of the College's faculty and students is far from being desirable but in the short-term is the only alternative available for continuing function and growth.

Commitments to the State -- The College of Pharmacy at the University of Minnesota is dedicated to providing the needed pharmacy health personnel particularly for the State of Minnesota, but also for the Upper Midwest and the nation as a whole. At the same time, these students (undergraduate and graduate) as well as practicing pharmacists (on a continuing education basis) must be provided with the type of education which will enable them to provide quality health care as dictated by current concepts and trends and future expectations. As the only institution in Minnesota offering a degree in Pharmacy and as the only institution in the Upper Midwest offering the Doctor of Pharmacy degree, the facilities of the College of Pharmacy at the University of Minnesota are critical to the supply of adequate manpower.

If shortage areas are defined in the pharmacy profession, the areas considered most critical would include the specialists (i.e., the Pharm. D.) and the rural practitioners. In addition, as hospitals and extended care facilities place greater emphasis on effective drug distribution systems, greater responsibilities are placed on the College for the training of the individuals to fill these roles. The most dramatic increase in manpower resulting from the funding of this application will be in the area of the pharmacy specialist -- the Doctor of Pharmacy. It is planned to increase the enrollment of students in this program by about 50 students per class. A plan will be developed to accept students into the Pharm. D. program from states having no such program and no likelihood of developing them. Thus, we would take 5-10 students from Colorado, Wyoming, Montana, North Dakota, South Dakota, Iowa, and, possibly enrollment can be handled in the new facility. This plan will be implemented the first year that the facility is occupied.

Conclusions:

1. The programs and faculty have outgrown the presently occupied renovated old (1915) School of Mines building, Appleby Hall.
2. An old apartment house (Fenwick) has been renovated for use of faculty and students concerned with Clinical Pharmacy, Pharmacy administration and continuing education. This facility represents a temporary situation.
3. The enrollment in students exceeds the calculated maximum capacity of Appleby Hall by more than 50 percent. Without a new facility the faculty must choose between decreasing enrollment or compromising the quality of programs.
4. Laboratory space for graduate programs is inadequate despite the conversion of all but one classroom in Appleby Hall.
5. There is no space, ^{other} than experimental, for a learning resources center which is so very important to the development of the "Student as Learner" concept enthusiastically supported by the faculty.
6. Program quality, innovative programs and pioneering efforts which have characterized this College of Pharmacy are being seriously challenged by the consequences of inadequate facilities.

ENROLLMENT INFORMATION EXHIBIT

1. Present Enrollment as of October 15, 1974

A	Undergraduate	Health Professions		Public Health
		B.S.	Pharm. D.	Pre-degree Grad
	1st Year	123		1st
	2nd Year	127		2nd
	3rd Year	120	15	X
	4th Year		10	
	5th Year			
	6th Year			
	TOTAL	370	25	
B	Graduate Degree	66		
C	Continuing Education	1200		

2. Enrollment Base

A. Highest undergraduate first year enrollment in the five years preceding the year of application (1969-1973)	123
B. First year enrollment assured as the result of a previous Health Professions Construction grant	-
C. Statutory first year enrollment required under the capitation grant program	123
Enrollment Base (highest of above)	123

3. Assured Enrollment Increase (Entire student increase must be assured in the first year, except for major expansion).

A. Number of Students 40% increase

Year after Completion	Academic Year	First-year Undergraduate	Advanced	Continuing Education
1st	*1977-8	173	75	1400
2nd	1978-9	173	80	1800
3rd	1979-80	173	85	1900

*See Item 15B of application for date of occupancy.

B. First-year undergraduate student enrollment increase (for 10-year period of commitment) over highest enrollment shown in No. 2: 50

COLLEGE OF PHARMACY UNDERGRADUATE AND GRADUATE ENROLLMENT FIGURES

	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
First Year	94	96	112	120	123	123	123	123	173	173	173
Second Year	83	95	85	97	124	127	123	123	123	173	173
Third Year	73	65	76 + 8* =84	78+8* =86	108+10* =118	120+15* =135	127+16* =143	123+20* =143	123+25* =148	123+30* =153	173
Fourth Year	-	-	-	8	8	10	15	16	20	25	30
38 Total Undergraduate Enrollment	250	256	281	311	373	395	404	405	464	524	549
Graduate Enrollment	39	42	41	55	55	66	70	70	75	80	85
Total College Enrollment	289	298	322	366	428	461	474	475	539	604	634

*Students entering the Pharm. D. program after completion of their first academic degree.

Item 9 - DESCRIPTION OF PROGRAMS TO BE CONDUCTED IN FACILITY

I. - ORGANIZATIONAL STRUCTURE OF THE SCHOOL

As stated in the Statement on the Mission of the Health Sciences, the Regents of the University of Minnesota have authorized a unified organization of the Health Sciences that has brought together in a single administrative structure programs in Medicine, Nursing, Public Health, Dentistry, Pharmacy, and the University Hospitals. Veterinary Medicine which has related interests works closely with this administrative unit.

Overall responsibility for this administrative structure is vested in the Office of Vice-President for the Health Sciences. The Vice President has responsibility for developing goals and operational plans in conformity with the missions of the Health Sciences and for developing inter-unit collaboration in fulfilling the missions of the Health Sciences. In addition, he works in close cooperation with other University Vice-Presidents on Health Sciences matters relating to their areas of responsibility. The School of Medicine, the School of Dentistry, the College of Pharmacy, the School of Nursing, the School of Public Health, and University Hospitals comprise the Health Sciences on the Twin Cities campus of the University of Minnesota. Each unit is represented by a dean or director reporting directly to the Vice President for Health Sciences with the exception of the College of Veterinary Medicine which relates as an adjunct member. In addition, a Council of Deans and Directors serves the Vice-President in a cabinet capacity.

The College of Pharmacy is directed through the Office of the Dean in conjunction with the Assistant Dean for Student Affairs, the Assistant Dean for Graduate Studies, the Assistant Dean for Professional Education, and the Assistant Dean for Administration.

The major advisory body at the College level is the Faculty Council which is comprised of the Dean and the four Assistant Deans.

The following organizational chart points out the intra-College relationships as well as the interrelationships between the College of Pharmacy and the other Health Sciences units. The broken connecting lines represent a direct cooperation with and reliance on a given unit for course and/or clinical experience responsibility.

Coordination of the clinical experiences with the affiliated sites is carried out through the Director, Professional Practice. Letters of cooperation from these sites are available and will be supplied upon request.

Other interdisciplinary and interdepartmental faculty committees include:

University Level: Council on Liberal Education
University Administrative Committee
University Coordinating Council
University Senate
Patent Advisory Panel
University Committee on the Uses of Human
Subjects in Research

Health Sciences Level:

Design Review Committee (Health Sciences Expansion)
Space Allocation/Educational Resources of Health Sciences
Cedar-Riverside Project (A Health Care Proposal)
Austin-Albert Lea Project (A Health Care Proposal)
Rural Health Care Project
Allied Health Committee
Clinical Research Committee
Health Sciences Constitution and By-Laws
Health Sciences Learning Resources Advisory Committee

Health Sciences Cancer Research Committee
Health Sciences Committee for Disadvantaged Students
Health Sciences Council
Health Sciences Learning Resources Committee
Health Sciences Constitutional Drafting Task Force
Health Sciences Receiving Committee Task Force

College Level:

Professional Education
Student Admissions and Scholastic Standing
Library
Scholarships, Fellowships, & Loans
Research Awards
Building
Safety
Continuing Education

Actions of these committees range from those which have purely advisory capacities to those of a policy formulation and implementation nature. The actions are reported to the administrations of the various levels indicated.

Contemplated changes:

Health Sciences Level -- A coordinator of Basic Health Sciences is anticipated to be added to the Vice-President's Office. In addition, momentum is being generated for a separate School of Allied Health Sciences (presently incorporated into the Medical School organization).

UNIVERSITY OF MINNESOTA

BOARD OF REGENTS

PRESIDENT OF THE UNIVERSITY

V.P. for Administration

V.P. for Coordinate Campuses & Educational Relationships

V.P. for Academic Administration

V.P. for Health Sciences

V.P. for Finance, Planning & Operations

V.P. for Student Affairs

Coordinator for Allied Health Programs
Coordinator for Health Care Systems (Research & Development)
Assistant V.P. for Health Sciences Affiliations
Coordinator for Health Sciences Planning
Coordinator for Health Sciences Continuing Education

COUNCIL OF DEANS AND DIRECTORS

Medical School

School of Public Health

School of Nursing

College of Pharmacy

School of Dentistry

College of Veterinary Medicine (Adjunct Member)

University Hospitals

Dept's of Anatomy
Microbiology
Pathology
Pharmacology
Physiology

Pharmacy Service
Dept. of Family Practice
Drug Information Center
Masonic Memorial Hospital
Variety Club Heart Hospital

Pharmacy Curriculum

Affiliated Clinical Sites

COLLEGE OF PHARMACY

Dean
L.C. Weaver

Administrative Staff
Mrs. Gratia Ouellette, Supervisor
Mr. Leslie Collins, Supervisor
Mr. James Lundberg, Administrative Assistant

Assistant Dean
Student Affairs

Dr. F. E. DiGangi

Assistant Dean
Graduate Studies
and Research
Dr. T.O. Soine

Assistant Dean
Professional
Education
Dr. E.J. Staba

Assistant Dean
Administration
Dr. H.F. Kabat

ASSISTANT DEAN, PROFESSIONAL EDUCATION

Professional education is the most demanding societal responsibility in our College. Departments no longer exist so faculty are recognized for the educational role that they can accomplish while still retaining their disciplinary designation. Individual faculty are responsible to the Assistant Dean, Professional Education to carry out the curriculum for both the B.S. and Pharm.D. programs.

The baccalaureate and doctor of pharmacy curricula are sequenced programs of classroom and clinical education effectively integrated throughout the entire curriculum. A primary effort is made to develop a particular attitudinal set and patient orientation, so instruction through-out the last 3 or 4 years has been arranged in a logical flow with a proper sequence of material which promotes unifying concepts, integration of basic science education, relevance and growing independent demonstration of the ability to use this knowledge. The student focus is upon the promotion of learning instead of teaching, independence instead of dependence; in short, an educational environment which will produce a goal directed, socially aware, critically inquisitive pharmacist. These programs are based on a core of basic healthy behavioral and clinical knowledge and are followed by sequenced study and training along tracks planned by the student from elective offerings in relation to his/her individual career interests. Provision is made to involve the student through case studies, discussion courses, and patient contact, while minimizing lecture instruction. A multimedia approach is utilized incorporating library resources, texts, special teaching aids such as film clips, slides and audio or video taped presentations, handouts and syllabi, small group discussions, tutorials, and laboratory exercises.

The relevance of the entire educational process to the ultimate practice goal is dramatized by early introduction to the patient where clinical problems in a variety of settings are shown to the students from the first year of their pharmacy education. The inter-relatedness and importance of the basic health and pharmaceutical science disciplines is built into the sequence. This concurrent exposure outlines the relevance of basic health and pharmaceutical science education. Special elective clerkships permit the student to select the emphasis desired evident on that area of pharmacy in which he/she anticipates practice.

Educational Development

Central to both the b.s. and Pharm. D. programs is utilization of the educational concept "Student As Learner". This involves the initiation of experimental programs, with grant support where possible, which become the building blocks to a better educational process.

Through integrated teaching and course consolidation, the development of the student or professional as learner concept, relevant testing and learning by testing procedures, improvement of teaching by feed-back and evaluation mechanisms from both pre- and post-professional education, better development and establishment of health science roles for pharmacists, and there will be created a curriculum which is vital and responsive to society's needs.

Teaching Methodology

Faculty members have been professional in trying new teaching methods. Some of these have been well evaluated. Future application of these methods to the new educational concept will be tried, improved and implemented. Sharing is a natural consequence.

Professional Education Committee

This Committee is responsible to the Assistant Dean, Professional Education. Its membership comes from the faculty and includes representatives of everyone on the staff.

Teaching Assistants

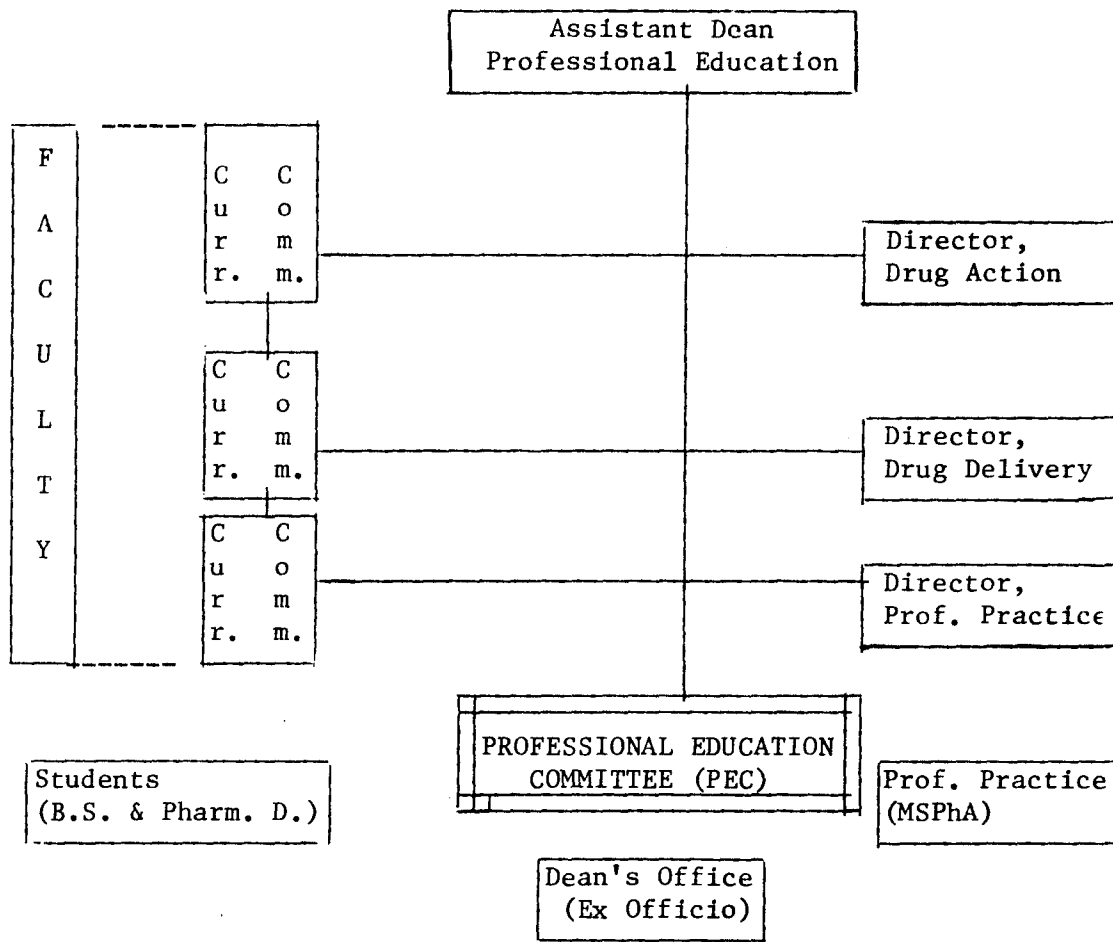
TA's are considered as a part of the teaching staff of the University for professional education. The responsibility for optimum utilization of these TA's resides with the Assistant Dean. Professional education will require coordination with the Assistant Dean for Graduate Study and Research.

Faculty Evaluation

The Assistant Dean for Professional Education has a responsibility for contributing to the evaluation of faculty for merit increases, promotion and tenure, and the evaluation of teaching effectiveness. The Assistant Dean will be responsible for liaison with the Health Sciences Educational Policy Committee and participate in the development of interprofessional health science education.

PROFESSIONAL EDUCATION

A. Organization



Professional Education Committee (PEC) Members -- (10)

1. Directors (3)
2. Faculty-Elected (3) - one from each Curriculum Committee.
3. Students (2) - one B.S./one Pharm.D.
4. Professional Practice (1)
5. Assistant Dean (1)
6. Dean's Office (Ex Officio)

Professional Education

Unit Definitions

Drug Action Unit

The Drug Action Unit will be responsible for providing the student with curriculum contents related to therapeutic agents and their mechanisms of action. Topics which will be covered are:

1. Mechanisms of drug action at the organ level (Pharmacological basis of therapeutics).
2. Mechanisms of drug action at the molecular level (Biochemical and molecular pharmacological basis of therapeutics).
3. Structure activity considerations specifically as related to groups of therapeutically useful agents.
4. Chemical characteristics of therapeutic agents which contribute to their usefulness. Structural features which contribute to the (in) stability or specificity of therapeutic agents etc.
5. Therapeutic uses of drugs e.g. uses, toxicity, side effects contra-indications and drug interactions.

Drug Delivery Unit

The Drug Delivery Unit will have its main emphasis on those pharmaceutical, biochemical and physiological systems and processes which affect the delivery to and removal of a drug from its site of action. Drug Delivery differs from Drug Action in that its main emphasis is on the rate and amount of drug reaching the "biophase"* as opposed to what actually occurs as a result of the drug reaching the "biophase". Drug Delivery will place much of its emphasis on the dosage form incorporation of the drug and consider what effect the formulation itself can have on drug delivery. More specific areas of interest include:

1. Drug absorption, distribution, excretion and metabolism particularly with respect to how these processes will affect the rate and extent of drug delivery.
2. The effect of drug formulation on drug delivery.
3. The effect of route of administration on drug delivery.
4. The effect of chemical structure on drug delivery.
5. The effect of interaction of normal and abnormal physiological and/or biochemical processes with the drug and/or its dosage form on drug delivery.

* The term biophase refers to a real or hypothetical environment in which a real or hypothetical drug receptor resides.

Professional Practice Unit

The Professional Practice Unit will deal with curriculum content involving the application of prerequisite and concurrently taught basic drug knowledge to real patient problems. Three general areas of professional practice can be identified.

1. Therapeutics - use of the "biological language" of the health sciences (patient data) to:
 - a. Assess drug efficacy
 - b. detect adverse drug reactions and interactions
2. Socialization and Communication Skills - several broad areas of patient related skills can be identified; examples are:
 - a. Data gathering skills (patient interview and history, etc.)
 - b. drug information evaluation skills
 - c. intervention skills once a therapeutic problem has been detected
 - d. patient/public education skills
3. Pharmaceutical Systems - evaluation of pharmaceutical systems with regard to their impact on the ultimate quality of patient care.

B. Professional Education Committee (PEC)

1. The committee chairman is elected.
2. Committee secret ballot on all motions and amendments.
3. Assistant deans, program directors, and/or individuals concerned with issues under discussion may be invited to attend committee meetings.
4. Provide direction to the three unit curriculum committees.
5. Determine and/or recommend changes in the professional program (sequence, credit, etc.).
6. Approve all new required and elective professional course offerings.
7. Review and recommend direction relating to the pre-professional program and the basic health science program.
8. Recommend new faculty and supportive personnel needs.
9. Develop, evaluate, and approve guide lines for course, instructor, and T.A. evaluation.
10. Grant applications, and residency site acquisitions, that affect the professional curriculum shall be presented to PEC in adequate time so that the committee might be informed and make comments.
11. Recommend allocation of budget money for curriculum development.
12. PEC must be informed, but approval is not necessary, for experimental programs that involve students beyond the required professional program.
13. PEC must approve programs in which students participate and are excluded from a part of the curriculum, or where experience is an elective which satisfies credit requirements for graduation.

C. Unit Directors

1. Prepare agenda, minutes, and information bulletins for the unit curriculum committee.
2. Appoint three unit faculty members to each of the other unit curriculum committees.
3. Assign specific course content responsibility to appropriate faculty after consultation with unit faculty and assistant dean for professional curriculum.
4. Supervise instructor and course evaluation procedures.
5. Counsel assistant dean for professional curriculum as to promotion, pay increase, etc. of unit faculty involved in the professional curriculum.
6. The Pharm. D. program is under the auspices of the Director of Professional Practice.
7. Act as liason between unit faculty and appropriate units and divisions to assure that such things as T.A. help, lecture and laboratory rooms, materials, etc. are available for professional instruction.

D. Unit Curriculum Committee

1. Elect a representative to PEC.
2. Implement PEC and/or faculty approved directions with respect to the professional program and its prerequisites.
3. Recommend to PEC changes with respect to the professional program and its prerequisites.
4. Establish specific course objectives, and what students will be responsible for.

E. Assistant Dean

1. Prepare agenda, minutes, and information bulletins for PEC.
2. Assign faculty, to Units, and provide annually provisions for possible Unit change by a faculty member.
3. Provide for faculty and T.A. evaluation, their interpretation, and use.
4. Provide direction for unit directors.
5. Counsel dean of the College of Pharmacy as to promotion, salary increases, etc. of staffs within the division, and after consultation with the unit directors.
6. Be responsible for the final assignment of T.A., and only after consultation with the Assistant Dean for Graduate Studies and Research, and the Unit directors.
7. Represent the College of Pharmacy on the Basic Health Science Educational Policy Committee.
8. Provide direction for preparing the "Bush Foundation Grant".

II. FACULTY

A. Current and Projected Composition

Faculty usually are given A (12 month) or B (9 month) appointments and either full or part-time. Full-time generally means a commitment of 5 days per week while part-time means an obligation of less than 4 1/2 days per week for 9 or 12 months depending upon the type of appointment. Nearly all appointments are 12 month.

CURRENT FACULTY LISTING AND PROJECTED FACULTY LISTING FOR 1979-80
(Three years following building occupation):

<u>Department</u>	<u>1974-75</u>		<u>1979-80 (Full capacity assumed)</u>
	FT + PT = F.T.E.	Existing Vacancies	FT + PT = F.T.E.
Medicinal Chemistry	5 + 0.5 = 5.5	0	11 + 2 = 13
Pharmaceutics	6 + 0.1 = 6.1	0	10 + 1 = 11
Pharmacognosy	3 + 0.2 = 3.2	0	5 + 0.5 = 5.5
Clinical Pharmacy*	6 + 10.5 = 16.5	0	15 + 21.5 = 31.5
Unassigned**	10 + 0.5 = <u>10.5</u>	0	15 + 3 = <u>18</u>
Totals-----	-----41.8	-----	-----84.0

FT - - Full Time Faculty

PT - - Part Time Faculty

FTE - - Total Full Time Equivalents

*Clinical Pharmacy classification includes personnel involved in the Graduate Program in Pharmacy Administration.

**Unassigned category includes administrative personnel, continuing education personnel, and special project personnel.

Full-time faculty members are currently allowed to consult on the basis of 1/2 day per 5-day work week.

Out of College Teaching Responsibilities

Currently, only two regularly scheduled teaching programs are being pursued by the Pharmacy faculty in other areas of the University. Both are health science interdisciplinary in nature. There are, however, numerous instances of isolated lectures and/or programs being taught or contributed to by the staff. These relate mainly to drug abuse and the relationship of drugs and their delivery to the other health science disciplines, as well as to presentations at the basic science level. The interdisciplinary nature of teaching responsibilities is gaining

momentum and the probability of expanding this type of instruction into other health science areas is very high. Due to the overload of the present facilities in Appleby Hall, these activities presently take place at other sites within the University setting. In the proposed facility, these activities will be scheduled into the building space as the regular teaching schedule will permit.

Current and Projected Salary Ranges

	<u>1974-75</u>	<u>1978-79</u>
Professor	\$18,900 - 31,935	\$20,000 - 40,000
Associate Professor	18,900 - 26,000	18,000 - 32,000
Assistant Professor	15,050 - 19,000	16,000 - 24,000
Instructor	15,000 - 16,000	15,000 - 20,000

B. Current and Projected Faculty - Student Ratios

In the determination of the faculty-student ratio, we have used enrollment figures only for those students in their last 3 or 4 years of professional study (1st year - 60% of total; 2nd year - 100% of total; 3rd year - 100% of total; 4th year - 100% of total) plus 75% of the total number of graduate students enrolled in the College of Pharmacy. This was calculated in this manner as:

- (1) At least 40% of the teaching responsibility during the third year of studies falls upon the faculty of the Basic Health Sciences (Medical School), and;
- (2) In most cases, approximately one-fourth of the graduate student's course load is pulled from areas of the University other than the College of Pharmacy.

CURRENT

1st year students --	123@ 60% = 73.8
2nd year students --	127@ 100% = 127.0
3rd year students --	135@ 100% = 135.0
4th year students --	12@ 100% = 12
Graduate students --	66@ 75% = <u>49.5</u>
Total.....	397.3
Total F.T.E. Faculty = 41.8	
<u>41.8</u>	= <u>1</u> Faculty-Student Ratio
397.3	9.50

There are several methods for the determination of student/faculty 1979-80 ratios. By another process the University states the College ratio to be about 1:10.

1979-80

Three years following building occupation.

Entering class of 172 with 49 being in the Pharm. D. program.

1st year students --	172@ 60% = 103.2
2nd year students --	172@ 100% = 172.0
3rd year students --	165@ 100% = 165.0
4th year students --	49@ 100% = 49.0
Graduate students --	85@ 75% = <u>63.75</u>
Total.....	552.95

Total F.T.E. Faculty* = 84.0

84.0 = 1 Faculty-Student Ratio
552.95 6.58

*Based on full-time status, assistant professor and above in academic rank, and including "unassigned" faculty.

This lowering of the faculty-student ratio is to a large extent an evolutionary result of the increased emphasis on clinical educational programs. These directions in the curriculum would occur irrespective of the new facilities although progress in this direction would be severely hampered without the expansion. These limitations would stem from the lack of physical space, from the lack of proximity to the Health Sciences Center, and from the lack of innovative teaching space and facilities. This projected faculty-student ratio compares favorably with the ratios for other Health Science areas.

III. CURRENT CURRICULUM AND PROGRAMS

A. Undergraduate Program

The College of Pharmacy prepares its graduates to function in society as a provider and/or administrator of patient oriented pharmaceutical services. These services include the provision of drug information, drug distribution, and drug-use control of both prescription and non-prescription drugs to ambulatory and institutionalized patients, and to prescribers and other health professionals.

The undergraduate curriculum provides two possible degree options - the five year Bachelor of Sciences degree and the six year Doctor of Pharmacy degree. The basic communication skills and background sciences are mastered by the students in both programs during two initial years in the literary college. A thorough knowledge of these subjects is essential as:

- a. the basic biological and physical sciences form the framework on which the basic health sciences course work will be built;
- b. the pharmacist must be able to communicate and respond and he must be able to do this with confidence; and
- c. the pharmacist must have a broad outlook and understanding which enables him to adapt to and deduce from a continually changing set of principles and trends.

Years three and four are offered jointly for both the B.S. and Pharm. D. programs and cover the basic health sciences, the pre-clinical pharmaceutical sciences, and related requirements. Clinical experience, along with specialization in areas of primary interest round out the final year (B.S. program) or two years (Pharm. D).

The contemporary concept of pharmacy education places primary emphasis on patient orientation which has caused increase coursework in the area of the biological sciences and in the area of society and human behavior. This does not mean that there has been a de-emphasis of the physical-chemical aspects of pharmacy because of a lack of need for knowledge in these particular areas but rather an integration process resulting in a block of education which yields greater utilization and application in today's health care delivery system.

The Doctor of Pharmacy degree program was initiated in September of 1971 in response to the growing demand for highly trained pharmacists prepared specifically for clinical practice in patient care environments. The program prepares the student for at least the following functions.

1. Member of the pharmacy-therapeutics committee;
2. Selection and evaluation of drug products;
3. Director of drug information service;
4. Review of new drugs on a regular, on-going basis for physicians and others;
5. Therapeutics consultant to other health care professionals;
6. In-house instruction of hospital staff in areas of continuing education as it relates to drugs and drug use;

7. Clinical pharmacokinetics (non-investigative);
8. New drug research (assist physicians);
9. Triage; and
10. Poison control and emergency medicine.

The following tables summarize the current curriculum and the assignment of student time by academic year.

BACHELOR OF SCIENCE DEGREE

DOCTOR OF PHARMACY DEGREE

		BACHELOR OF SCIENCE DEGREE				DOCTOR OF PHARMACY DEGREE	
Years of Study Required		5				6	
Prepharmacy Years Required		2				2	
Professional Years Required		3				4	
ACADEMIC YEAR	COURSE (# of Quarters running)	Quarter Credits	Lecture-Recitation Hr/Wk	Lab Hr/Wk	Total Hr/Wk		
1 (Prepharmacy)	General Chemistry (3)	14	5	3	8	SAME	
	Trigonometry (1)	3	3	--	3		
	College Algebra & Anal. Geometry(1)	5	5	--	5		
	Communications (3)	4	4	--			
	General Electives	9	?	?	?		
Total		<u>43</u>					
2 (Prepharmacy)	General Biology (2)	10	4	3	7	SAME	
	Introductory Physics (2)	10	4	3	7		
	Organic Chemistry (3)	14	5	3	8		
	Principles of Economics (2)	8	4	--	4		
	General Electives	<u>6</u>	?	?	?		
Total		48					

BACHELOR OF SCIENCE DEGREE

DOCTOR OF PHARMACY DEGREE

ACADEMIC YEAR	COURSE (# of Quarters running)	Qtr. Credits	Lecture- Recitation Hr/We	Lab Hr/Wk	Total Hr/Wk	
3	Pharmacy, Drugs and Health Care (1)	3	3	0	3	SAME
(First Professional Year)	Med. Chem. (2)	6	3	3	6	
	Biochemistry of Medicinals (2)	6	3	--	3	
	Fundamental Principles and Processes (1)	3	3	--	3	
	Public Health(1)	3	3	--	3	
	Introductory Calculus (1)	5	5	--	5	
	Elementary Anatomy (1)	4	3	3	6	
	Human Physiology (1)	7	6	2	8	
	Microbiology (1)	5	3	6	9	
	Pathology (1)	3	3	--	3	
	Electives	4	?	?	?	
Total		<u>49</u>				

BACHELOR OF SCIENCE DEGREE

DOCTOR OF PHARMACY DEGREE

ACADEMIC YEAR	COURSE (# of Quarters running)	Qtr. Credits	Lecture- Recitation Hr/Wk	Lab Hr/Wk	Total Hr/Wk	
4	Organic Med. Agents (3)	15	5	--	5	SAME
	Introductory Pharmacognosy (2)	10	4	3	7	
	Fundamental Principles & Processes (1)	4	3	3	6	
	Dosage for Design (2)	10	3	6	19	
	Social and Behavioral Aspects of Practice (1)	4	4	--	4	
	General Pharmacology (2)	7	{ 3 3	{ 3 0	{ 6 3	
Total		<u>50</u>				

BACHELOR OF SCIENCE DEGREE

DOCTOR OF PHARMACY DEGREE

ACADEMIC YEAR	COURSE	Qtr. Credits	Lecture-Recitation Hr/Wk	Lab Hr/Wk	Total Hr/Wk	COURSE	Qtr. Credits	Lecture-Recitation Hr/Wk	Lab Hr/Wk	Total Hr/Wk
6 (Fourth Professional Year -- Last Year of Pharm. D. Program)	None					Clinical Residency Rotations Electives	* *		40	40
						*Varying to Meet Individual Students Needs.				
Minimum Qtr. Credits Required for Graduation		240					257			

In the B.S. program all students must elect 6 credits of coursework from among the following:

- Phar 5210 (2 cr) Terminology of the Health Sciences (Programmed Instruction)
- Phar 5220 (2 cr) Advanced First Aid; First Aid procedures including American Red Cross course
- Phar 5230 (2 cr) Social Control Law, ethics and legal procedures
- Phar 5235 (2 cr) Legislative Drafting Research, Drafting and Labeling of legislation to control drug use
- Phar 5240 (2 cr) Pharmacy Management Decision making and policy planning; utilizing fiscal records
- Phar 5255 (2 cr) Social and Psychological Aspects of Death and Dying
A survey of the role and social organization of death in society and the relationship of the pharmacist to the terminally ill patient
- Phar 5265 (2 cr) Drugs and the Elderly
Psychological, sociological, physiological, pharmacological and economic aspects of aging and their effect on drug utilization in the elderly.
- Phar 5275 (2 cr) Drug-Induced Diseases
An organ system approach to introgenic disease, mechanism of pathology, incidence, severity, reversibility and detection.
- Phar 5280 (2 cr) Contemporary Pharmacy
Seminar on Contemporary Topics
- Phar 5281 (2 cr) Over-the-Counter Preparations
- Phar 5285 (3 cr) Drugs and Society
Drug use problems and community involvement and leadership as a strategy for prevention and treatment
- Phar 5290 (3 cr) Clinical Clerkship
- Phar 5299 (2 cr) Special Problems
Elementary Investigation in elements of professional practice
- Phar 5700 (2 cr) Hospital Pharmacy
Provision and Management of Pharmaceutical Services in Institutional Settings
- Phar 5970 (2 cr) Directed Studies

Other Professional Electives:

Electives are considered a very important segment of the curriculum. Not only do they provide for a more liberal education, but they also allow for specialization in a given field closely linked to or an integral part of the profession of pharmacy. This can be especially noted in the Pharm.D. curriculum.

In addition to general electives offered from throughout the University and the required clinical electives, the student can select professional electives from health science areas. Those offered through the College of Pharmacy include:

- Instrumentation in Medicinal Chemistry (3)
- Special Problems in Medicinal Chemistry (cr ar)
- Modern Concepts in Medicinal Chemistry (3)
- Cosmetics and Dermatological Preparations (3)
- Special Problems in Pharmaceutics (cr ar)
- Antibiotic Colloquium (2)
- Hormone Colloquium (2)
- Pharmaceutical Immunology (2)
- Special Problems in Pharmacognosy (cr ar)
- Veterinary Science (3)
- Biological Assay of Drugs (3)
- Pharmacometrics (3)
- Pharmaceutical Manufacturing (6)
- Parenteral Products (3)
- Vitamins and Hormones (2)
- Antibiotics, Vitamins and Hormones Laboratory (1)

Beginning July 1, 1975 all undergraduate courses will not carry a departmental designation. There has been a reorganization of the college along functional lines to create a faculty of pharmacy. The office of the Assistant Dean, professional education, is responsible for curriculum. Several collegiate disciplines contribute to the students education.

a. MEDICINAL CHEMISTRY

The undergraduate role of Medicinal Chemistry is to educate the student in the application of the principles of chemistry to therapeutic usage of both inorganic and organic medicinal agents. The use, nature, potency, and analysis of medication as well as molecular structure - biological activity concepts are considered. Students become familiar with basic structures responsible for a given pharmacological response as well as with the functional moieties modulating that response.

b. PHARMACEUTICS

The function of the Pharmaceutics faculty is to provide instruction for undergraduate students regarding the pharmaceutical behavior of drugs in physical and biological systems. In effect, this training makes the potential graduate a dosage form expert. Basic instruction is provided in thermodynamics, chemical kinetics, radio-activity, and homogeneous and heterogeneous equilibria. In addition, the principles governing the absorption, distribution, metabolism, and excretion of drugs in the human are studied. Through lectures, demonstrations, and laboratory work, undergraduate students are instructed in the preparation of dosage forms, together with their physical, chemical, and pharmacological characteristics.

c. PHARMACOGNOSY

Undergraduate emphasis is placed upon those drugs derived from cell systems (microorganisms, plants, and animals) used to treat or prevent a disease state. The lectures provide instruction in immunologicals, enzymes, antibiotics and the vitamins, hormones, and alkaloids. Among the subjects considered in the laboratory are poisonous plants and fungi, habit forming plants, pathogen identification, antibiotic production and assay, steroid isolation and biotransformation, glucose tolerance testing, immunodiagnostics, serum electrophoresis, OTC diagnostics, and immune injury.

d. CLINICAL PHARMACY

The mainstream functions of pharmacy practice are clinical in nature. They include a responsibility for drug distribution, accumulation and dissemination of drug information and drug-use control. Clinical pharmacy instruction integrates that body of knowledge drawn from established pharmaceutical science disciplines into the social setting in which pharmaceutical functions exist. Emphasis is placed upon those biological, economic, ethical, legal, political, and social factors which affect the selection, use, adverse effects, abuse, and non-use of drugs in our society.

A sequenced program of classroom and clinical education integrated throughout the pharmacy curriculum most effectively accomplishes the above objectives. Since a primary effort is being made to develop a particular attitudinal set and patient orientation, instruction through-out the last three years has been arranged in a logical flow with a proper sequence of material which promotes unifying concepts, integration of basic science education,

relevance and growing independent demonstration of the ability to use this knowledge. The student focus is upon the promotion of learning instead of teaching, independence instead of dependence; in short, an educational environment which will produce a goal directed, socially aware, critically inquisitive pharmacist. This program is based on a core of basic behavioral and clinical knowledge and is then followed by sequenced study and training along tracks planned by the student from elective offerings in relation to his/her individual career interests. Provision is made to involve the student through case studies, discussion courses, and patient contact with a minimal amount of lecture instruction. A multimedia approach is utilized incorporating library resources, texts, special teaching aids such as film clips, slides and audio or video taped presentations, handouts and syllabi, small group discussions, tutorials, and laboratory exercises.

The relevance of the entire educational process to the ultimate goal of pharmacy practice is dramatized by early introduction to the patient where clinical problems in a variety of settings are shown to the students from the first year of their pharmacy education. The inter-relatedness and importance of the basic health and pharmaceutical science disciplines is built into the sequence. This concurrent exposure outlines the relevance of basic health and pharmaceutical science education. Special elective clerkships permit the student to select the emphasis desired evident on that area of pharmacy in which he/she anticipates practice. The following pages outline the characteristics of some of the various clinical setting options available to the pharmacy student.

2 CREDIT OPTION: CLINICAL CLERKSHIPS -- AMBULATORY

SITE	LENGTH OF SESSION	CLASS TIME	STUDENT-FACULTY RATIO	EDUCATIONAL AIDS	OUTSIDE OF CLASS STUDENT INPUT
Community Pharmacy Settings (40)	5 weeks	One afternoon per week; 4 hrs	5:1	Handouts; reference and journal article reproductions	General reference; answers to specific questions
Appel Pharmacy	5 weeks	One afternoon per week; 3 to 4 hrs.	2:1	Handouts	General reference; preparation of presentation to nursing home personnel.
Cambridge State Hospital*	5 weeks	One afternoon per week; 4 hrs	4:1 8 students maximum	Films; handouts	Preparing patient work-ups; general reference; answers to specific questions
Diabetes Detection and Education Center	1 week	5 days -- 7 am to 6 pm**	4:1	Films; observation of patients interviews; handouts	General reference; preparation for talks with the diabetics.
University Hospitals (Out-patient)	5 weeks	2 weekly meetings; @ 3 hrs each	2:1	Videotape critique; handouts	General reference; Preparation for talk to nursing staff; answers to specific questions.
Veterans Administration	5 weeks	One afternoon	2:1	Handouts	General reference; answers to specific questions.
Stillwater State Prison	5 weeks	1 day/week	2:1	Handouts	General reference; preparation for counsel discussion sessions

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*Students are rotated through an epileptic service, a mentally retarded/physically handicapped service.

A mentally retarded/mentally ill service and the outpatient infirmary.

**Same schedule as that of the diabetic patient.

2 Credit Option (Continued): CLINICAL CLERKSHIPS -- AMBULATORY

SCHEDULE ANALYSIS

SITE	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5
Community Pharmacy Settings (40)	<ol style="list-style-type: none"> 1. Patient histories 2. Patient record systems 3. Patient consultation 				
Appel Pharmacy	<ol style="list-style-type: none"> 1. Orientation 2. Visit to nursing homes & talks with personnel. 	Monitoring of patient drug therapy through use of patient drug profiles (at store).		Student presentation (on selected subject) to nursing home health personnel; e.g., drug interactions	
Cambridge State	<ol style="list-style-type: none"> 1. Orientation to hospital and types of patients. 2. Patient work-up*** 	<ol style="list-style-type: none"> 1. Patient work-ups 2. Discussions with other health personnel (e.g., dentists, social service, psychologists). 3. Conference/Discussion/Review. 			
Diabetes Detection and education Center	<ol style="list-style-type: none"> 1. A review of the disease, its therapy and management 2. Patient management 3. Patient education 4. Medical team management Participates in conferences and discussions. Talks to patients on OTC medications in relation to their disease.				

***Work-ups are similar to those in the Clinical Conference Course.

2 Credit Option (Continued): CLINICAL CLERKSHIPS -- AMBULATORY

SCHEDULE ANALYSIS

Site	Week 1	Week 2	Week 3	Week 4	Week 5
University Hospitals -- Outpatient	Orientation to: 1. Drug history interviews 2. Drug interactions 3. Psychology of interviews		Experience in: 1. Taking drug histories 2. Patient record systems 3. Handing out medications and counseling patients. Possible participation in functions of special interest (e.g., clinical pharmacology rounds).		Each student is required to give a talk to the nursing staff sometime during the experience. Topics are picked with the aid of the clinical instructor.
Veterans Administration -- Outpatient	Experience in: 1. Patient histories 2. Patient record systems 3. Patient consultation and instruction to outpatients and patients being discharged.				
Stillwater State Prison	Orientation to prison life and patient care in the prison setting	Experience in 1. Drug education 2. Counseling 3. General discussions			

5 Credit Option: CLINICAL CLERKSHIPS -- ENRICHED

Site and Student- Instructor Ratio	Class Time per Session and Length of Session	Primary Focus of Study	Method Used
University Hos- pitals -- Stations 30,31 and 31 ICU (Medical Stations 2:1	20 hours weekly. 5 weeks	Antibiotic Therapy -- All patients on these wards with infectious diseases are followed and their therapies rationalized.	<ol style="list-style-type: none"> 1. Rounding 2. Physician and other medical personnel input 3. Infectious disease gran rounds. 4. Discussion/Conference sessions. 5. Limited didactic presentations. 6. Background readings (e.g., New Englan Journal of Medicine)
St. Paul Ramsey Hospital 2:1	Mon. - Sat. 7:30 a.m. 12:00 noon; 5 weeks	Internal medicine, Neurology, pediatrics -- the pharmacy student is assigned to one of the medical teams (comprised of two senior medical students, an intern and a medical resident). The pharmacy student is specifically instructed to utilize the medical student as a source of information regarding the correlation of disease states with diagnostic procedures, techniques of the physical examination and the significance of lab values.	<ol style="list-style-type: none"> 1. Daily rounding and familiarizing himself with each patient and his drug therapy. 2. Evening on-call work with his team. 3. Assignment (by medical resident) of certain patients with drug problems so student can act as resource person. 4. Assignment of other drug problems or evaluations 5. Twice weekly pharmacy conferences (2-3 hours each) 6. Medical journal and literature articles/discussion 7. Case presentations

5 Credit Option (Continued): CLINICAL CLERKSHIPS -- ENRICHED

Site and Student- Instructor Ratio	Class Time per Session and Length of Session	Primary Focus of Study	Methods Used
Cambridge State Hospital 2:1	2 full days per week; 5 weeks	Understanding of psychiatric and related drug therapy and the relationship to the total patient case. Students follow selected patients to develop patterns of therapy.	<ol style="list-style-type: none"> 1. Rounding with physician 2. Aid in outpatient clinic sessions. 3. Patient work-ups 4. Discussion/Conference Session 5. Assignment of outside reading material 6. Physician conferences
Drug Information Denter (University Hospitals) 3:1	10 hours per week; 5 weeks	Understanding of the function and organization of a drug information center and the research materials associated with it.	<ol style="list-style-type: none"> 1. Working in the Center 2. Assignment of problems (gathered from previous requests); developing reports; attending meetings of interest; outside reading assignments; etc.
Family Practice Clinic (university Hospitals) 2:1	20 hours weekly 5 weeks	Relating to the physician and the patient in the family practice setting	<ol style="list-style-type: none"> 1. Taking drug histories 2. Patient consultation 3. Drug information resource person 4. Discussion/Conferences 5. Outside reading assignments

B. Graduate Program **

The Master's and/or Doctoral degree are offered in the areas of Pharmaceutics, Medicinal Chemistry, Pharmacognosy, and Pharmacy Administration with only a Master of Science degree being available in Hospital Pharmacy. The graduate program is designed to provide a rounded experience via appropriate course work, seminars, and special lectures supporting a continuing, individualized research program.

Each student conducts original research under the supervision of a staff member who is selected by the student within one year of his matriculation. Such research is directed toward the development of the M.S. or Ph.D. thesis and is of central importance in the training of the candidate. The Graduate School offers the Master's degree under two plans: Plan A. involving a thesis, and Plan B. which substitutes additional course work for the thesis. These alternatives are accepted by the College of Pharmacy.

Candidates for graduate study in the Pharmaceutical Sciences should possess a Bachelor's degree in some science field such as pharmacy, chemistry, biology, pre-medical study, etc. Ordinarily, a background including elementary course work in organic chemistry, biochemistry, biology, physiology, microbiology, pharmacology, and physical chemistry is desirable. Deficiencies in these areas may be removed by remedial course work early in the candidate's graduate tenure.

a. PHARMACEUTICS

The Pharmaceutics Department at the College of Pharmacy presents a comprehensive program of course work and research offerings leading to the M.S. and Ph.D. degrees. A basic background in the physical and biological sciences is provided as a firm foundation for the study of modern pharmaceutics. The broad scope of the program affords the student an exceptional opportunity to elect a course of study which best meets his individual needs and interests. Minor fields which are particularly desirable include physical chemistry, chemical engineering, biochemistry, and pharmacology. This program is designed for the student who desires to prepare himself for a research career in education or industry.

In addition, the hospital pharmacy program, leading to a master of science degree in hospital pharmacy, is offered. This program is designed for the student who desires a responsible supervisory and managerial position in the hospital pharmacy environment.

The core subject material which is considered to be essential for effective research or teaching in pharmaceutics is as follows: (quarter credits given in parentheses)

- Differential Equations (3)
- Theory of Statistics (3)
- Physical Chemistry (16)
- General Pharmacology (10) - Normally satisfied by undergraduate training in pharmacy.
- Seminar (3-5)
- Advanced Analytical Methods (6-10)
- Stabilization of Pharmaceuticals (3)
- Pharmacokinetics (3-5)
- Interfacial Phenomena (3-5)
- Physical Pharmacy (4)

** See Appendix A (pages 199- 225) for a reproduction of the text found in the Health Sciences Graduate Program Bulletin (1973-75) dealing specifically with pharmacy related graduate programs and a copy of a pamphlet describing the programs at the College.

For a total number of quarter credits of 41-49.

The preceding listing of core courses represents approximately 55% of the total coursework required at the University of Minnesota for the Ph.D. degree. Thus, a substantial number of credits can be selected from related fields in which the candidate may have a special interest.

b. MEDICINAL CHEMISTRY

The Medicinal Chemistry Department at the College of Pharmacy presents a comprehensive program of coursework and research offerings leading to the M.S. and Ph.D. degrees. The program provides a background in modern medicinal chemistry and is characterized by having a strong biological component superimposed on a firm foundation in organic chemistry. The program has sufficient flexibility to permit designing a course for the individual student. In addition to coursework offerings within the Medicinal Chemistry Department the student will also be engaged in interdisciplinary studies in other University departments such as organic chemistry, biochemistry and pharmacology.

The basic core curriculum would be required of all trainees, and deficiencies in organic chemistry, physical chemistry, biology, physiology, etc. must be removed during the first year of graduate study. The core subject material essential for effective research and teaching in medicinal chemistry is composed of the following: (quarter credits in parentheses)

- Seminar: Medicinal Chemistry (6)
- Advanced Medicinal Chemistry (12)
- Research in Medicinal Chemistry (thesis)
- Organic Qualitative Analysis (4)
- Graduate Survey of Organic Chemistry (15)
- Stereochemistry (3)
- Graduate Survey of Biochemistry (9)
- Advanced Pharmacology (6)

The above listing of core courses represents approximately two-thirds of the total coursework required at the University of Minnesota for the Ph.D. degree. Thus, approximately one-third of the candidate's work can be selected from related fields in which the candidate may have a special interest.

c. PHARMACOGNOSY

The Pharmacognosy Department at the College of Pharmacy presents a comprehensive program of coursework and research offerings leading to the M.S. and Ph.D. degrees. The program provides an opportunity to study the medicinals in biological systems from any one of the following three perspectives: biochemical (product biosynthesis, isolation, and identification), botanical (chemotaxonomy, ethnobotanical, growth, and physiology), and microbiological (antibiotics, tumor antigens, antiviral screening, biotransformations, immunology). Because of the multidisciplinary nature of pharmacognosy, each student's program is constructed to meet their specialized needs and interests. In addition to the course-work offered within the Pharmacognosy Department, the student may also be engaged in interdisciplinary studies with other University departments such as biochemistry, botany, microbiology, medicinal chemistry and pharmacology.

Applicants with a Bachelor's or Master's degree in pharmacy, chemistry, biology or microbiology would normally be accepted into the pharmacognosy graduate program. Applicants with a non-pharmacy degree normally would be required to complete the undergraduate professional course sequence in pharmacognosy and in either pharmacology or medicinal chemistry. The core subject material for each Ph.D. candidate in pharmacognosy is: (quarter credits in parenthesis).

Antibiotics (2)
Vitamins and Hormones (2)
Medicinal Product Isolation and Identification (8)
Seminar (5)
Research in Pharmacognosy (thesis)
General Biochemistry (9)
Elementary Physical Chemistry (6) or
Physical Biochemistry (3)
Medical Microbiology (4)

For a total number of quarter credits of 33-36

In addition, each Ph.D. candidate would be required to complete approximately 20 credits in their selected minor.

d. PHARMACY ADMINISTRATION

Pharmacy Administration is a flexible interdisciplinary program of education and research on the social, economic, psychological, behavioral and political aspects of the organization and distribution of drugs and pharmaceutical services; the use, misuse, and non-use of drugs and drug information by patients and practitioners; and the role of the pharmacist as a health practitioner in relation to the public, his profession, and other health practitioners. This program in Pharmacy Administration leading to the M.S. and Ph.D. degrees, has been developed in response to a need for persons who are capable of interpreting the social scene, reflecting upon the political, behavioral and economic forces affecting it and then anticipating the need for change. These persons must have a broad knowledge of the social environment within which health care is provided, the economics of health care provision, the political system, and the relationship of these to pharmaceutical function.

The graduate faculty includes a medical sociologist, a social psychologist, a biostatistician, a market research analyst, a comprehensive health planner, a hospital administrator, and clinical pharmacists. Students can expect some significant immersion into clinical settings in which pharmaceutical functions exist.

The curriculum emphasizes breadth of learning in contrast to technical development and is structured around six basic areas:

1. the economic system,
2. the social system,
3. the political system,
4. the health care system,
5. basic management techniques, and
6. pharmacy and its environment.

The following courses form the core of the major area:
(quarter credits given in parenthesis).

Seminar (1 cr.)
Research problems (cr. ar.)
Drug Marketing (3)
Advanced Drug Marketing (3)
Legislative control (3)
Legislative control (3)
Clinical Conferences (2)
Clinical Clerkships (2-5)
Clinical Therapeutics (6)

Administrative Clerkship (cr. ar.)
Special Clinical Problems (cr. ar.)
Pharmacy and its Environment (9)
Elements of Economic Analysis (6)
Social, Economic Aspects of Health Care (3)
Statistics
Data Processing

The following areas include courses that may be selected for addition to the major area, as a minor area or as a collateral field of study. A collateral field of study must include 9 credits. Minor area will include a minimum of 1/6th of the total coursework offered. The program of study will ordinarily include three of the following areas:

Anthropology
Business Administration
Education
Economics
Political Science
Psychology
Public Administration
Public Health
Sociology

C. Continuing Education

The purpose of Continuing Education in Pharmacy is best understood as activity designed to accomplish certain tasks with outcomes to be consistent with the highest possible levels of education and training for the profession of pharmacy and for the University as an institution committed to excellence in research, teaching and service. These tasks can be arranged in order of priority, and set forth as follows:

1. The primary task of c.e.p. is to develop and present learning experiences for practicing pharmacists which will enable them to maintain their competence and update their skills.
 - 1.1. Changing professional roles will require that pharmacists also be helped to develop new abilities and to assume new responsibilities.
 - 1.1.1. An appraisal of trends and new directions for the practice of pharmacy in both the community and institutional setting is needed to determine program content related to new professional roles.
 - 1.2. Programs employing a variety of learning formats will be required in order to meet the different learning-style preferences of practicing pharmacists.
 - 1.3. There is a need to provide learning experiences at a number of different sites throughout the State so that registrants will have reasonable accessibility to programs.
 - 1.3.1. There is a further responsibility to provide these programs in greater numbers because Minnesota registrants must now meet State requirements for mandatory continuing education.
 - 1.4. There will be an involvement in program development. This is understood to include diagnosis, program planning, and evaluation.
 - 1.4.1. Diagnostic procedures will lead to the identification of educational, prescriptive, and motivational needs.
 - 1.4.2. Program planning is the procedure of designing an educational activity based on identified needs. It will involve establishing goals and objectives, selecting appropriate resources, choosing appropriate techniques, outlining each session, establishing budgetary matters, and assigning responsibilities.
 - 1.4.3. Evaluation provides a check on the effectiveness of the program, the extent to which its objectives have been reached, and the points at which improvement in the program are necessary.
2. A task of c.e.p. is to train and equip pharmacists so that they in turn may conduct health care programs in patient/lay public education.
 - 2.1. Health care programs are developed in those specific areas in which the pharmacist is assumed and expected to have expertise.
 - 2.2. The contents of these programs are packaged for the pharmacist, and the pharmacist is provided with appropriate training in methods for conducting the health care programs as trainer/educator.
3. A task of c.e.p. is to periodically re-examine and re-evaluate the goals of the department.
 - 3.1. There is a need to review the validity of mid and long range objectives, and to determine the extent to which they are being realized.
 - 3.2. There is a need to assess the extent to which one's own educational research is contributing to both the clarification and the attainment of the goals of the department.

- 3.3. There is a need to investigate, research, and be receptive to innovative approaches to programming in order to reach to goals of the department.
4. A task of c.e.p. is to develop and maintain an efficient office which will provide effective organizational support toward the realization of the tasks which rightfully belong to the department.
 - 4.1 This will include normal office procedures, together with the accurate recording of participation in programs.
 - 4.2 This will include being knowledgeable and willing to answer questions and enquiries from the clientele.
 - 4.3 This will include effectively interfacing with those support services provided by other C.E.E. departments.
5. A task of those involved in c.e.p. is self growth and development.
 - 5.1 This is accomplished in part by membership in a number of professional groups and through participation in related activities, programs, and meetings; and in part by reading and reviewing professional journal articles.
 - 5.1.1. A component of this is communication and consulting with adult education specialists in other health professions and in other fields.
 - 5.2. An aid to one's own growth and development is acceptance of responsibility for the growth of one's colleagues, hence the need to establish a learning climate.
6. A task of c.e.p. is to meet certain responsibilities which come from membership in academic units and University groups. This involves C.E.E. and the College of Pharmacy at the academic unit level, and also the Health Sciences Continuing Education Coordinating Council, a council designed to strengthen and facilitate health sciences C.E. programming.
 - 6.1 For the College of Pharmacy, this includes involvement in a number of projects having an educational component, internal consulting and advising on educational matters, and faculty development.
7. A task of c.e.p. is to foster a number of relationships at both the State and national levels which have a direct bearing on the goals and work of the department. Professional expertise, guidance and effort may be provided in the course of the relationship.
 - 7.1 At the State level, this is accomplished through working relationships with the College Alumni Association, State Board of Pharmacy, Pharmaceutical Association, certain community and State health organizations, and groups of pharmacists in specific geographic areas.
 - 7.2. At the national level, this is effected by relating to the appropriate Councils and Special Committees of the American Association of Colleges of Pharmacy.

With the enactment of mandatory continuing pharmacy education legislation in 1973 (implementation by March, 1975), this particular aspect of the College's educational role has taken on added importance.

Course content varies from year to year dependent upon the stated needs of the practitioners. The current year's program includes the following:

1. Television Lecture Series #7 -- PRACTICAL DERMATOLOGY

The seventh pharmacy television lecture series comprised of five one-hour tapes, was introduced during the '73-74 season and now will be presented at a number of additional sites throughout the state. The subject for the learning programs is practical dermatology, and the resource person is Dr. William Gentry, of the Department of Dermatology, Medical School,

University of Minnesota. After the showing of each tape, there will be a resource person present who will answer questions and lead a discussion on the subject.

The additional sites at which this Series will be presented are International Falls, Thief River Falls, Winona, and Morris.

The program is designed for pharmacists in both hospital and community practice, as well as nurses and others who must care for the patient with a dermatological problem. The course includes a study of dermatitis, acne, psoriasis, cutaneous infections, drug eruptions, dry skin, insect bites and burns. New and unusual therapies will be studied.

The objectives of the program are to familiarize participants with the more common dermatoses clinically, and to understand the pathophysiological processes operating in these diseases. Participants will be assisted in recommending therapy, and will become aware when a physician should be consulted. The rationale for therapy given by dermatologists will also be studied.

CARDIOVASCULAR

2. Television Learning Series #8 -- PROBLEMS AND DRUG THERAPY

The eighth pharmacy television learning series, comprised of five one-hour color tapes, will be presented at a number of sites throughout the state during 1975. The accompanying map shows the sites where this series will be presented in 1975.

The subject for the learning programs is the cardiovascular system, with emphasis on physiology, disorders, and treatment. The learning programs will draw on the teaching faculty of the Health Sciences Center, University of Minnesota.

The objectives of this Series are as follows:

- a. to review the normal anatomy and physiology of the cardiovascular system, with attention given to the fundamental relationships:
blood pressure, cardiac output, heart rate, peripheral resistance and stroke volume
- b. to examine the major risk factors leading to coronary heart disease, how a knowledge of these factors may be used in primary prevention of this disease.
- c. to study specific disease states of the Cardiovascular system: hypertension, heart failure, ischemic heart disease, and certain cardiac arrhythmias

The incidence, underlying causes, predictability factors, clinical manifestations, and prognosis of cardiovascular diseases examined.

The drug therapy involved in the treatment of cardiovascular diseases including efficacy, method of action, proper dosage, side effects, adverse reactions, contraindications, and levels of absorption and metabolism will be studied.

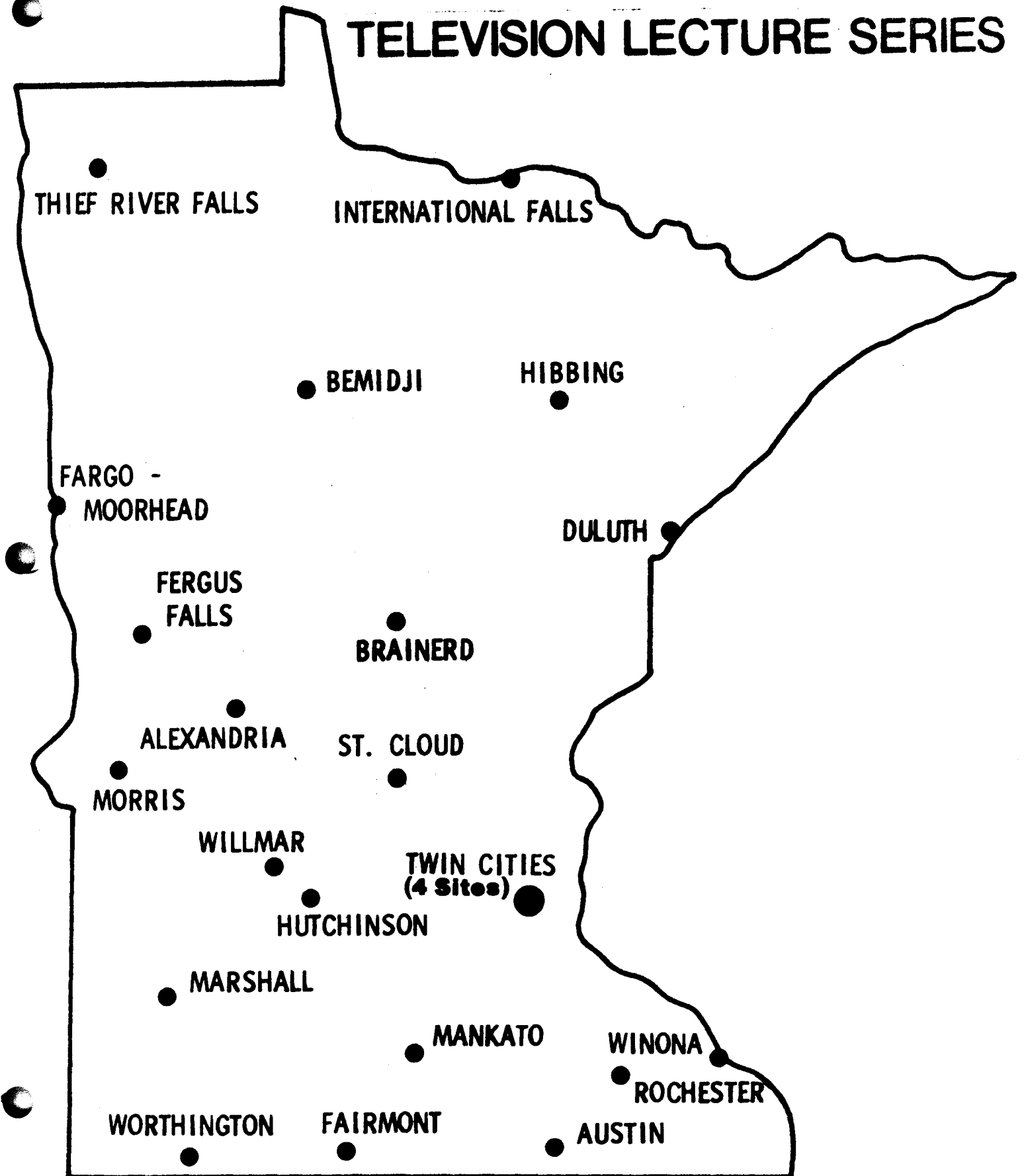
- d. to develop a rationale for providing patient education to those affected by cardiovascular diseases.

Included are T.V. tape presentations, discussion period, notebook, printed outlines and supplementary learning materials.

3. Conference on Modern Pharmacy Management

This two day conference, jointly sponsored by the Minnesota State Pharmaceutica Association and the College of Pharmacy, is designed to provide information that will assist the pharmacist in the areas of merchandising, advertising, and business and financial management. The use of computer systems and services will be studied; techniques for employment interviewing and planning the best

SITES FOR THE COLLEGE OF PHARMACY TELEVISION LECTURE SERIES



use of the pharmacist's time will also be covered. A competent faculty will be responsive to participant questions and problems, and will seek to provide information and strategies that will be useful in the successful resolution of the problems.

4. Conference on Non-Prescription Medication

This is a 2-day conference and it is designed for pharmacists who are continually requested to recommend non-prescription drugs and products, and will aid the pharmacist in making rational decisions and in providing appropriate advice for a number of classes of over-the-counter (OTC) preparations. Indications and non-indications, mechanisms of action, how to administer, drug interaction, adverse reactions, and product evaluation will also be covered. The faculty for this program will be members of the College of Pharmacy.

5. Introduction to Clinical Pharmacy: A Seminar for Hospital Pharmacists

This two-day seminar is designed for hospital pharmacists who feel a need to learn the principles and procedures involved in clinical pharmacy. Participants will be introduced to the problem-oriented medical record with an explanation on its organization. The meanings of the different lab values will be studied, with emphasis on relating chart information with patient progress. Participants will be involved in presentations on hyperalimentation, patient education program structurings, in-service training programs, providing drug information to health professionals, and drug utilization studies. In addition, there will be workshops on monitoring the patient with specific diseases. Participants will also study interprofessional relationships and strategies for the implementation of new roles.

6. Program in Applied Biopharmaceutics and Pharmacokinetics

This program is designed to provide a practical introduction to modern drug therapy based on biopharmaceutical principles. The kinetics of drug absorption, distribution, and elimination will be discussed. Participants will be able to discuss drugs, their quality and dosage form more knowledgeably.

The program is part of a homecoming program jointly sponsored by the Alumni Association and the College of Pharmacy, and will be held on Saturday morning.

7. Seminar for Area D Pharmacists

In cooperation with Central Minnesota A.H.E.C., the College will present a learning experience for the pharmacists of Central Minnesota. The faculty for this program are from the faculty of the College of Pharmacy and the objectives are as follows.

To assist the practitioner:

- a. to respond to requests for help and referral concerning poisonings with OTC and household products
- b. to provide more meaningful services to the elderly through a study of medications requiring caution when administered to geriatric patients.
- c. to understand his/her role in drug therapy control, consultation and drug information for patients on psychotropic drugs.

8. Lectures on Pharmacist/Nursing Home Relationships

This series of six two-hour lectures is directed to pharmacists who provide professional services to nursing homes and other health care facilities, and who must relate with existing systems within these institutions. Inservice training activities, regulations and requirements, patient care and benefit, and operational procedures of intermediate and skilled care facilities will be studied. Gerontology and the effects of institutionalization on the elderly

will be emphasized.

The course will be given by University faculty and will be held in Appleby Hall (College of Pharmacy).

The enrollment will be limited in order to provide a good interaction between instructors and participants.

9. Introduction to Community Clinical Practice

The College of Pharmacy will present a conference which will stress the clinical pharmacy concepts as they relate to community practice. These will be considered under four headings: identify problems, gathering data, communication, and chronic drug management. In identifying problems there will be a study of epidemiology and mechanisms of drug-induced disease, drug interactions, and patient non-compliance. Under the subject of gathering data there will be a study of patient profiles, drug histories, and drug information sources. With the study on communication, there will be emphasis on pharmacist-physician, and pharmacist-patient relationships with attention given to instituting patient education programs. Under the area of chronic drug management there will be an examination of congestive heart failure, hypertension, and oral contraceptive agents. The conference includes workshops which provide opportunity for applications of the principles studied.

10. Workshop on Care and Treatment of the Diabetic

This program, presented in cooperation with the Diabetes Education Center, St. Louis Park is designed for pharmacists and other health professionals. It presents a clinical approach to this disorder. Participants will study both acute and long-term complications, the role of diet in the management of this disorder, the medications used in the treatment of the diabetic, pattern control, the role of exercise, and psychological adjustment to diabetes. The pharmacist's role in patient education in the community will be studied. Participants will perform some of the laboratory procedures.

Participants in this workshop will be expected to have completed study of the programmed instruction text, "Care and Treatment of the Diabetic".

11. Seminar on Leadership Training for Pharmacists

This six-week program is jointly sponsored by the Minnesota State Pharmaceutical Association and the College of Pharmacy, and is designed to lead to a number of learning outcomes which will enable participants to accept more responsibility in voluntary groups, and civic and professional organizations. Areas that will be studied include: leadership styles and behavior; decision-making processes; management of stressful situations; and how interpersonal relations affect the achievement of stated goals.

The seminar, presented by University faculty, is recommended for those seeking to develop leadership skills.

12. Audio Cassette Programs

Continuing Education by audio cassette is especially directed to individual or small group study, and is most applicable to those who wish to study on their own or who are prevented from participating in planned seminars and conferences.

The cassette tapes are packaged in a holder notebook, which also included lecture outlines, visual aids, self-check tests, and a final examination. For those wishing to study in a group, rather than individually, one complete set may be ordered, with the remainder of the group members ordering study sets at half-price, which contain all materials except the tapes.

INFECTIOUS DISORDERS AND DRUG THERAPY

This set is composed of 6 audio cassette tapes:

Program	Title	Author/lecturer
1.	"Drug, Bug, Host Relationships"	Allan C. Kind, M.D.
2.	"Infectious Disorders of the Respiratory Tract"	John B. O'Leary, M.D.
3.	"Venereal Diseases and Genitourinary Infections"	Allan C. Kind, M.D.
4.	"Antibiotic Sensitivity Testing" and Veterinary Med."	Donnal J. Blazevic, M.P.P.
5.	"Pediatric and Hospital Infections"	John M. Matsen, M.D.
6.	"A Dermatologist and an Internist Discuss Skin and Traveler's Disease"	Harold G. Ravets, M.D. and Allan C. Kind, M.D.

This series has been approved by the State Board of Pharmacy for 12 hours of credit in C.E. (1.2 C.E.U.'s).

13. Programmed Instruction Course

Programmed instruction materials provide an excellent opportunity for individualized study. The learner is led by easy steps at his own pace, at a convenient time, and in surroundings of his own choice through a learning experience which provides instant feedback on his progress.

The author of the College's first experience in producing a programmed instruction course is Robert B. Johnson, Jr., B.S., R.Ph. Mr. Johnson is a graduate of the College ('72) and currently is in his final year of studies in the Medical School, University of Minnesota.

Care and Treatment of the Diabetic

This is a programmed instruction text for pharmacists, and other health professionals. The course includes a general description of diabetes, the treatment of diabetes, techniques in diabetic care, and ketoacidosis and hypoglycemic reactions. There are four review cases, complete with questions and answers, and final review cases together with a final examination.

14. Providing a series of articles for the Minnesota Pharmacist entitled "Practical Science for Pharmacists". The objectives here are threefold:

- a. to provide practical scientific information to the pharmacist.
- b. to bring the faculty closer to the profession, and
- c. to provide for direct interaction between the pharmacist and the faculty.

With the large amount of new drug information coming out each year, with the increased awareness the practicing pharmacist is developing toward the need for continuing education, with mandatory continuing education for relicensure, and with the need for the restructuring of the health care delivery system, this area will continue to grow and serve an ever increasing percentage of the profession.

D. Health Research Program

Faculty members are encouraged to undertake original research projects closely aligned to their particular interests. A large majority of this research directly relates to the graduate and undergraduate teaching programs. Essentially 100% of the research is health related. A majority of the research program is funded from outside of college resources through the initiative of the individual researcher. It is estimated that approximately 10% of the college's own resources are devoted to this area.

The current research interests of the various departments can be outlined as follows:

a. Pharmaceuticals:

Current research includes investigations regarding the mechanics and mechanisms of the segregation or demixing phenomena observed in systems of particulate solids. These studies include the experimental determination of relative and absolute rates of mixing and segregation in multi-particulate systems subjected to vibration or shear, as well as the theoretical interpretation of the observations.

Research interests also include studies generally concerned with diffusion and transport phenomena in pharmaceutical systems. Current activity centers around diffusional behavior of drugs in solutions of hydrophilic colloids, drug dissolution rates, and the mechanism of the reaction of fluoride salts with synthetic and natural tooth mineral, hydroxyapatite.

Biopharmaceutics -- Interests are mainly concerned with the effect of dosage form design on the rate and extent of drug absorption. Investigations are currently being carried out in the release, dissolution, and absorption of various dosage forms of theophylline and meprobamate. In addition, assay procedures are currently being used and new ones developed to monitor plasma drug levels in seizure patients, hypertensives, persons suffering from chronic obstructive lung disease, and mentally disturbed patients. **

In another area of pharmaceuticals, research interests include the chemical activity and reactivity of molecules with anisotropic liquid systems. Such systems are under study with regard to the thermodynamic and steric contribution of the solvent to the observed solute behavior.

Physical and chemical stabilization of pharmaceutical systems -- The systematic examination of pharmaceutical systems of interest, using physico-chemical knowledge, to elucidate causes of chemical and/or physical stability problems and the prevention or minimization of the problems are also being studied.

Pharmaceutical manufacturing and product development -- Research and graduate lecture interests consist of the examination of the chemical, physical, political, economic, psychological, and social problems associated with industrial and/or pharmaceutical development, manufacturing, and marketing of health sciences related commodities; this includes F.D.A. regulation, new drug application, patent application, etc.

b. Medicinal Chemistry:

A variety of research programs are offered based on the research interests of the individual staff members. All programs, however, deal basically with the utilization of chemistry in the solution of biological problems. This premise has been proven many times over. Because of the wide latitude of research

** See Appendix B (page 226) for letter of certification.

offered under such a mandate, the department offers a correspondingly wide spectrum of research activity as illustrated by the following brief descriptions of current programs.

(i) Identification of drug metabolites in vivo and in vitro and the examination of the biochemical mechanisms of drug biotransformations. Elucidation of the physiological function of the polyamines by the use of amino acid antimetabolites.

(ii) Structure-activity studies of Digitalis receptors together with synthetic efforts to produce a less toxic cardenolide. Coupled with this research is an effort to find biologically active sesquiterpenes based on naturally-occurring prototypes.

(iii) Study of the ways in which molecular properties of drugs and other foreign molecules influence specific biotransformation reactions such as occur in the metabolic activation of cancer-producing chemicals. Another interest is in the stereochemical aspects of drug-receptor interactions as applied to histamine receptors with the hope of explaining allergic and non-allergic response in molecular terms.

(iv) Research in the design and synthesis of organic compounds which will selectively inhibit the reactions of certain enzymes which are vital to cellular growth. Since all cells must double their DNA content prior to cell division and also because cancer cells divide at a very high rate, special interest is in the preparation and testing of compounds which will interfere with enzymes involved in the DNA synthesis. Another interest is in the synthesis of compounds which might give information concerning the mechanism of action of antibiotics.

(v) Syntheses of amino acid analogs, homologs and analogs of homologs, with antimetabolic or chemotherapeutic potential, using biochemical rationale as the basis for their design. Currently, attention is being focused on the synthesis of proline and lysine analogs that are potential inhibitors of collagen biosynthesis. Possibilities are also being explored for the synthesis of a wide variety of other proline, ornithine, lysine, citrulline and arginine analogs and homologs.

Studies on the metabolic basis for action of certain drugs is being carried out by examining their biochemical transformations and metabolic disposition in animals with the aid of the radiolabeled drugs. Current focus is on ethanol metabolism and its influence on the metabolism. Parallel interest lies in the design, synthesis and biochemical and pharmacological evaluation of drugs latentiated by enzyme action.

(vi) Investigations of the relationships between stereostructure and biological activity of different classes of medicinal agents. A large component of this research is focused on drugs which act at narcotic analgesic receptor sites. Another program that has been underway for several years is the design and synthesis of site directed, irreversibly acting narcotic antagonists. Still another area is the investigation of the relationships between physico-chemical parameters of CNS-acting drugs and their entry and exit into the brain. A program to synthesize selective inhibitors of prostaglandin biosynthesis recently has been initiated and is vigorously being pursued.

(vii) Studies involving isolation, purification, structure elucidation and synthesis of a variety of natural products are being carried out for the purpose of obtaining leads toward potentially useful biologically active agents. Studies have involved mainly alkaloids and natural-occurring coumarins. Structure-activity relationships of active compounds are explored by means of suitable synthetic congeners. Studies relating to the effect of stereochemistry

on neuromuscular junction blocking potency of curarimimetic agents are also being pursued through the synthesis of suitable stereochemically defined probes.

c. Pharmacognosy:

Current research in the Pharmacognosy department is concerned with the growth, physiology, and biosynthesis of medicinals in higher plants; the use of multi-liter plant suspension cultures for the biosynthesis or biotransformation of medicinals; the development of an antiviral and tumor antigen program; human allergens; and ginseng phytochemistry and physiology.

Medicinal Plant Tissue Cultures: A study of free cells and differentiated tissues derived from medicinal plants for their ability to biosynthesize and biotransform alkaloids, antibiotics, cardenolides, hallucinogens, steroids, etc. The biological systems examined are aseptic, continuously subcultured, and grown as suspensions in either Erlenmeyer flasks or pilot-scale fermentor. Of further interest and study are the effects of one tissue culture line upon another; the ability for a cell line to reorganize and form a new medicinal plant; and the inter-relationships between both plant and animal viruses to a plant cell line.

Mechanisms of Steroid Metabolism and Transformation: A study of the stereochemistry and mechanism of enzymatic hydrogenation and dehydrogenation reaction in the liver and hepatoma, steric aspects of catalytic hydrogenation and isolation of antibiotics from fungi.

Tumor Antigen Isolation, Characterization and Use in Immunization: Tumor cells are being grown in cell culture and as transplants in experimental animals. Tumor antigens isolated from transplanted tumor tissue. Antigen will be purified and characterized via column chromatography and other methods.

d. Pharmacy Administration/Clinical Pharmacy:

The widespread use and dependency on drugs and drug product in today's society coupled with an increased utilization and application of pharmaceutical services has created a need for research into the social, psychosocial, political, legal, historical and economic factors that impinge upon the use, non-use, and abuse of drugs.

There is a need for research directed toward determining and evaluating the pharmacist's role in society with respect to the delivery of health care and with respect to interactions concerning the general public, other health professionals, and his peers. In addition, there must be research into the system for provision and delivery of pharmaceutical services and how this inter-relates with comprehensive health planning, existing and projected health care delivery systems, the improved utilization of health manpower and health education.

The pharmacy administration group at the University of Minnesota is currently engaged in the following research projects:

1. the stages and processes of socialization in pharmacy education;
2. drug utilization in the nursing home environment;
3. a definition of future alternatives for health care delivery through the use of delphic probes and cross-impact matrix analysis;
4. demonstration projects on expanded roles for pharmacy in the H.M.O. and small group medical practice environments;
5. the use of a Relative Value Study (R.V.S.) system for price determination of pharmaceutical services;
6. an examination of the interface of pharmacy practice with fertility control and the dispensing of birth control information;

7. developing and testing a model for drug use control among the elderly;
8. exploration of the myths associated with the practice of pharmacy;
9. developing and implementing the use of computer systems in pharmacy practice;
10. exploring the certificate-of-need concept as it related to pharmacy;
11. developing a consumers guide to pharmaceutical services.
12. development of pharmaceutical service quality assessment methodology;
13. studies involving consumer expectations and satisfaction: and
14. impact studies on scheduling of abusable drugs.

IV. PLANNED CURRICULUM AND PROGRAMS

A. Undergraduate Program

The curriculum to be instituted in the new facility will basically follow the same content definitions as found in the existing undergraduate curriculum. These have been outlined in a previous section of this application. Contemplated changes fall mainly within the scope of educational development where a concept or integrated approach to learning will continue to be refined. This will free up blocks of time in the last professional year for more extensive clinical experiences. The curriculum will continue to emphasize the individuality of the learner based upon needs and will stress the utilization of an experienced and expert faculty as resources for learning. Self paced learning for the student will become fully operative.

The newly emerging curriculum in the College of Pharmacy is placing increasing emphasis on (1) the patient and (2) the utilization of more self learning and small group teaching. The students will find more free time being provided in their schedules for autotutorial instruction using print and non-print materials. The patient aspect of this new emphasis has been adequately provided for in the past and with the move to the Health Sciences complex, this will be facilitated even to a greater extent. Present facilities severely limit the second area of emphasis - that of self-learning and small group teaching. The new facilities will not.

The faculty of the College of Pharmacy is currently in the process of defining the curriculum in terms of behavioral objectives. Movies are being sought to develop a parallel form of the curriculum which would be self-paced and allow each individual student to proceed through the curriculum at his or her own rate.

Careful planning has been completed for the Phase I Health Sciences construction program in order to develop integrated and coordinated educational resources facilities.

New and existing course presentation (including laboratories) will be much improved by the new facilities. Laboratories and classrooms have been designed with the individual student in mind. Being able to work off of the central production and control facilities of both the University and the Health Sciences, the College of Pharmacy will be provided with a myriad of audiovisual technique possibilities. The auditoria, conference rooms, and seminar rooms will be tied into the central control facility located in Unit A. One of the 150 seat auditoria within Unit F will be outfitted for computer response capabilities. Classrooms and conference areas provide complete flexibility. Computer facilities will be available which will tie in with the Health Sciences computer. The increasing emphasis on the individual in the laboratory setting is evidenced by planning which will permit activities such as multiple demonstrations, small group interaction, individual study, and individual experimentation. Television monitors for teaching purposes are located at strategic sites throughout the building.

The utilization of these audiovisual techniques and materials will be in conjunction with the Learning Resources Center of the Bio-Medical Library and the study, lounge, and carrel areas within the College. These efforts will be facilitated and promoted by the Educational Development Center to be located within the College. Here professional planning and technical assistance will be available for faculty and students.

Of great significance is the closing of the physical distance gap between the College programs, the Basic Health Sciences programs (i.e., pharmacology, anatomy, microbiology, physiology, and pathology) and the classroom facilities which are located in Unit A. These activities will be directly adjacent to Unit F and will thus be of much easier access to all students who must fulfill

requirements in these areas.

A critical aspect in the training of today's pharmacy student is advocating and demonstrating the concept of the interdisciplinary health team. The clinical training of the pharmacy student has advanced this concept considerably. Integrating the whole of the learning experience into the health sciences setting will extend this even further.

The Doctor of Pharmacy professional degree program will continue to expand with the aid of the new facilities. One of the primary consequences will be a continuation of the implementing of specialization options for the candidates. Among these is a proposal for the development of a program in the science of applied clinical pharmacology. In addition to meeting the requirements of the undergraduate pharmacy program, these students will be required to complete approximately nine quarter credits each in the following courses (or equivalents):

- Laboratory Pharmacy - laboratory instruction and training in the analysis of drugs in biological systems.
- Clinical Pharmacokinetics - application of the principles of kinetics of drug disposition to patient therapy.
- Clinical Therapeutics - understanding and application of drug action in patients.
- Clinical Clerkship - experience in patient care.
- Clinical Electives - Pharmacology 107 (Pharmacometrics);
Pharmacology 201-202 (Physiological Disposition of Drugs,
Pharmacodynamics); Medicine 206 (Clinical Conferences);
Medicine 104 (Introduction to Internal Medicine); Medicine 184
(Metabolism and Clinical Pharmacology); and many others, depending
on the interests of the student.

Another proposal will allow specialization in infectious disease therapy. In this program, as part of their elective options, students would opt for:

- Clinical Rounds and Hospital Laboratory Intern Assignments
(infectious disease therapy and sensitivity testing laboratory);
- Epidemiology and Venereal Disease Control;
- Graduate level medical microbiology, virology, and/or immunology;
- Antibiotic colloquium.

The options do not stop here. Highly individualized programs can be developed (and are encouraged) for all students (both B.S. and Pharm. D.). One of the most reaching effects of the new facility will be in this individualization and in the further development and promotion of the health team concept and the clinical role of the pharmacist within this concept. The interaction provided by the integrated facilities will work towards this goal.

B. Graduate Program

The existing graduate program will essentially be carried intact to the new facility. What will be evidences is expanded student capacity, greater learning and research opportunities through improved physical facilities and equipment, and the much greater opportunity for interprofessional educational and research activities with the other health science disciplines.

A new graduate program involving chemical engineering will be developed when resources are available. This program in bio-engineering (or pharmaceutical engineering) will reinforce the Pharm. D. program and will not take a large faculty

component to implement since some of the present faculty members are currently working in this area.

Two programs which will be further developed in the future are the Center for the Study of Pharmaceutical Systems (PharmaSYST) and the Institute of Pharmaceutical Sciences. Both will serve to create a critical mass of educators/researchers which will in turn be able to generate resource funds on an expanded on-going basis to support the graduate and research programs of the College. The thrust of the Center for the Study of Pharmaceutical Systems is directed toward the study of the provision, utilization, delivery, and outcome of pharmaceutical services while that of the Institute of Pharmaceutical Sciences will be directed toward studies in the basic pharmaceutical science area.

C. Continuing Education Program

The increased responsibility and commitment taken on by the College of Pharmacy in the area of continuing education has prompted a need for expanded administrative and production space for this activity. This commitment has added significance due to the fact that mandatory continuing education for pharmacists is a prerequisite for relicensure in the State of Minnesota starting with the 1975 licence renewal.

The philosophy that continuing education should be taken to the audience as often as is practical dictates heavy reliance on A-V production facilities. These facilities have been planned into Phase I of the health sciences expansion and are to be used on an interdisciplinary basis. In addition, the continuing pharmacy education administrative area will be located adjacent to the College's Educational Development Center and will thus be able to work closely with these individuals in planning and production.

In addition to the C.E. programs taken to the practitioners, the new facility will allow and facilitate short term on-site continuing education. These program will take the form of workshop/seminars which will utilize the individualized laboratory and carrel areas, auditoria and seminar rooms, and other student areas.

Another area of commitment in continuing education is directed toward the patient. Specific objectives for future involvement include:

1. To present planned educational experiences to groups of patients/consumers having similar health problems which will increase their compliance with prescribed health care procedures;
2. To involve the patient/consumer in accepting an active participatory role in his own health care;
3. To help patients/consumers acquire new knowledge, attitudes, behaviors, and skills in the area of health care; and
4. To assist patients/consumers to accept more responsibility for learning about their own health care and available health care services for themselves and their family.

D. Health Research Program

All health research within the College of Pharmacy is basically educational oriented and student participation is primary. Expansion of research will be in conjunction with the student increases in the graduate programs (approximately double) and with faculty increases. Improved specialized facilities and new equipment will allow greater range of research expression. Most notable expansions will provide for:

- a. greater biological research expression,
- b. improved cancer research methods,

- c. virus research (approved facilities),
- d. autoradiography,
- e. expanded tissue culture research,
- f. expanded synthetic chemical research,
- g. physical systems research,
- h. bioavailability research,
- i. health care delivery systems research,
- j. sociological research, and
- k. role model development.

Of special significance and aid will be the limited in-house computer facilities which will tie in with the larger health sciences computer.

Reference is again made to the formation of the Center for the Study of Pharmaceutical Systems and the Institute of Pharmaceutical Sciences. The critical mass of talent which will be made available will most certainly generate some of the funds needed for expanded research and research training programs.

V. CLINICAL RESOURCES

A. Current

1. Both hospitalized and ambulatory patients are required for clinical instruction. The number and type of sites for clinical exposure is more determinant than absolute numbers of patients. Students, during their senior year, rotate through these environments as part of the clinical conferences and clinical clerkships.

Affiliations for hospitalized patient education include:

- a. University of Minnesota Hospitals.....832 beds
 - 1. Pediatrics
 - 2. Oncology (Masonic Memorial Hospital)
 - 3. Neurology
 - 4. Cardiovascular (Variety Club Hear Hospital)
 - 5. Medicine
- b. Veterans Administration Hospital.....960 beds
- c. St. Paul - Ramsey Medical Center.....515 beds
- d. Hennepin County Medical Center.....387 beds
- e. Anoka and Cambridge State Hospitals.....800 beds

Affiliations for ambulatory patient education include:

- a. Anoka State Hospital
- b. Cambridge State Hospital
- c. Community pharmacy settings (40)
- d. Diabetes Education Center
- e. Skilled nursing facilities
- f. Stillwater State Prison
- g. University of Minnesota Hospitals
 - 1. Pharmacy Service (outpatient)
 - 2. Family Practice Clinic
 - 3. Drug Information Center
- h. Veterans Administration Hospitals (outpatient)

The majority of these affiliations are within a ten mile radius of the College of Pharmacy. Distance however, is not a limiting factor. In order to broaden the range of experiences, several sites are remote from the Twin Cities area - namely, Cambridge State Hospital (45 miles) and Stillwater State Prison (25 miles).

Other health science units utilize some of these same environments for their clinical education programs.

2. Externship Resources

The class of 1976 will begin a program in the summer of 1975 which will follow this schedule:

# of students	Summer	Fall	Winter	Spring
30	Externship	Open or Electives	Required Courses	
30	Open or Electives	Externship		
30	Required Courses		Externship	Open or Electives
30			Open or Electives	Externship

One fourth of the class will be sited at one of 40 externship sites each quarter during the academic year. These sites were selected because they possess physical facilities (patient record system) and concerned preceptors who are willing to become volunteer faculty and will provide financial support for the extern. Whenever possible sites have been selected where the Medical School's Rural Physician Associate Program has sited student physicians. All required and elective courses will be offered twice yearly.

A series of 700 questions organized into 12 broad competency areas were prepared by a committee of practitioners.

1. Prescription compounding
2. Dispensing
3. OTC Drugs
4. Patient Records
5. Patient Contact
6. Drug Information
7. Chemicals
8. Poisons
9. Devices
10. Laws-Ethics
11. Institutional Practice
12. Administration

Externs are pretested prior to joining the site and then upon completion are post tested to measure competency gain. Twice monthly visits by the externship coordinator and extensive use of an externship manual foster knowledge gain on site.

Criteria Used in Preceptor Selection

Educational Qualifications

Experience Qualifications

High professional motivation and competence

Past experience as a preceptor

Recommendations by interns

Clinical Attitude

Prescription volume, organization of Prescription, Department, etc.

Complete bank of otc drugs

Patient consultation practices

Patient Profiles

Participation in Professional Affairs

Teaching attitude vs. Production attitude

Willingness to spend time with Extern

Good ethical and compliance record

Inter-professional activities

Provision of additional services

Nursing Homes, Part-time Hospital, etc.

3. Residency Rotations (Pharm D)

Each Pharm. D. Resident participates in eight four week rotations. Four of the rotations are required and four are elective. The required rotations include, medicine, pediatrics, neurology and primary care. Elective rotations include medicine, renal medicine, poison control, drug information and burn therapy.

The affiliated sites and residency rotations available include:

State Hospitals - Anoka-Cambridge
Neurology

University of Minnesota Hospitals
Medicine
Pediatrics
Hematology
Family Practice
Drug Information

St. Paul Ramsey Medical Center
Medicine
Surgery (Burn Unit)
Pediatrics
Neurology

Hennepin County Medical Center
Renal Medicine
Poison Control
Emergency Medicine

Veterans Administration Hospital
Medicine
Surgery

Primary Care
Porvenir, New Mexico,
Starbuck, Minnesota

4. Rural Pharmacy Associates Program

A recent development in the pharmacy curriculum has been the establishment of a Rural Pharmacy Associates Program. Development has been in parallel with the Rural Physicians Associate Programs.

In a limited number of rural sites, pharmacy students who have completed the fourth year of the five year program and who have shown an interest in rural practice have been placed in externship settings where medical students are concurrently being placed. The following guidelines are being utilized:

- a. Pharmacy students will be placed preferably in the community pharmacy setting (hospital pharmacy possible).
- b. Pharmacy students will participate in the program serially for a duration of at least one quarter.
- c. Communities will be selected to correspond with the Family Practice Rural Associate Program so that Medical students and pharmacy students can be paired.
- d. Interprofessional (medicine-Pharmacy) therapeutics seminars will be jointly conducted by Family Practice and Pharmacy faculty.

The potential of this particular program as it relates to the development of the interdisciplinary health care team concept in health care shortage areas is very exciting and promising.

B. Planned

The College of Pharmacy at the University of Minnesota has been one of the pioneers in developing the innovative and essential clinical component of pharmacy education. Being a requirement for both the B.S. and Pharm. D. programs, extensive clinical resources have already been developed. These will not, however, be sufficient for future curriculum needs and additional sites will be required.

The direction of the curriculum for both the B.S. and Pharm. D. programs is toward a freeing up of the final year of didactic-type presentations in favor of greater clinical involvements. The potentials for this more intensive experience are extensive and very exciting.

The major expansion of clinical sites is in the area of the community pharmacy practice. A full-time clinical coordinator has been added to the faculty to organize a number of sites for this purpose. Students will be rotated through the sequence of sites in conjunction with the existing institutional exposure.

Heavy reliance will continue on the institutional setting. Existing sites will be maintained and expanded as need arises and as resources are developed which will allow for the expansion.

Currently candidates are being sought to fill clinical positions at St. Paul Ramsey Hospital (Neurology), the Veterans Administration Hospital in Minneapolis, the Community University Health Care Center in Minneapolis, the Area Health Education Center in Fergus Falls and the BC Outreach Community Clinic.

The future plans of the College call for the development of satellite Clinical units in Rochester and Duluth. If our concept of the health team is viable, then it makes sense to prepare health professionals at sites of other medical schools similarly to the way that we do it at the University's medical school. Involvement at these sites will require resident clinical faculty and pharmacy students in their 5th and 6th year of training. With the devotion of the final year of training entirely to clinical experiences, such a program is entirely possible. The pre-clinical training would remain a part of the Twin Cities program. It is planned that the clinical program will be modeled after the one presently in operation at the University. Preliminary contacts have been made with Rochester's Methodist Hospital and St. Mary's Hospital both of which are affiliated with the Mayo School of Medicine (established in 1972). The Duluth plans will be similar but remain to be developed.

The externship program is being implemented during the 1975-76 academic year. This gives the College clinical resources in various community areas emphasizing primary care. All students will participate in the program full time for a quarter in community pharmacies, hospital pharmacies, and/or organized comprehensive health care groups. To give greater depth to this program and to emphasize the development of the rural health team, a Rural Pharmacists Associates Program paralleling the School of Medicine's Rural Physicians Associates Program is being financed by the State and implemented. Medical and pharmacy students will spend one-half to one academic year together practicing in rural areas with physicians and pharmacists. A multi-disciplinary faculty will work with the students at this site. This program has the additional advantage that it will upgrade the competency of the practitioners of medicine and pharmacy. Also, we sincerely hope to improve the relationship between these two health professionals in the delivery of health to patients.

VI. LIBRARY RESOURCES AND LEARNING RESOURCES

A. Current

The College of Pharmacy Library currently is a college based function but is considered a part of the University Library System. It is located along with the College in Appleby Hall. Current holdings include 14,000 bound volumes, 270 serial titles, and indexes to domestic, foreign, and experimental drugs as well as a microfilm printer and the Iowa microfilm collection on clinical therapeutics. The library is open for general use approximately 45 hours per week and is accessible to graduate students and staff 24 hours a day, 7 days a week. Study space is included which can accommodate approximately 60 individuals at a given time. Circulation is approximately 7,500 units per year which does not include in-house library usage.

It should be kept in mind that pharmacy students and faculty also have access to the collection and space of the Bio-Medical Library which is located approximately 6 blocks from the existing pharmacy facilities.

Also located within Appleby Hall is the College's Learning Resources Center. Included are 6 study carrels, 2 audio-visual learning carrels, and some general study space. Physical limitations dictate the limited number of facilities available for student use. Audio-visual software includes slides, AV tapes, film strips and an audio cassette tape library. The Center also serves as the central storage point for the College's audio-visual equipment, ranging from projectors to CCTV.

TEACHING BY MEDIA

MEDIUM	COURSE	%TIME USED
Computer	Drug Abuse**	5
	Quantitative Medicinal Chemistry*	5
	Pharmacy management	25
	Clinical Therapeutics**	15
	Biopharmaceutics*	15
	Hospital or Clinical Graduate Degree Program	10
	Basic Science Graduate Degree Program	10
	Pharmacy Management**	10
	Pharm. D. Program**	15
Programmed Text	Pharmaceutics: Fundamental Principles and Process*	75
	Pharmaceutics: Dosage form Design*	20
	Terminology of the Health Sciences**	100
	Advanced First Aid**	50
	Pharmacognosy: Vitamins*	20
	Clinical Therapeutics: Diabetes**	5
	Drug Abuse**	5
Video Tape	Instrumentation in Medicinal Chemistry*	10
	Advanced First Aid**	5
	Drug Abuse**	10
	Clinical Therapeutics**	30
	Biopharmaceutics**	10
	Pathophysiology and Therapeutics of Disease**	25
	C.E. Video Tape Series	100

(TEACHING BY MEDIA CONT'D)

MEDIUM	COURSE	% TIME USED
Audio Tape	Management of Pharmaceutical Systems**	10
or	Drug Abuse**	10
Slide/Tape	Drugs and Health Care**	5
	Pharmacognosy*	10
	Medicinal Chemistry*	10
	Biopharmaceutics*	5
	C.E. Continuing Education Audio Tape Cassette Series	100
Closed	Drug Abuse**	10
Circuit	Advanced First Aid**	10
Television		
Films,	Basic Sciences	25
Slides &	Clinical Sciences	20
other Visual aids		

* Basic Pharmaceutical Sciences

** Clinical Sciences

Self-Instruction by Media

Level of Study	% of Hours	Self-Instruction Medium
Basic Science	10	Programmed text; slide/sound programmed text; computer
Clinical Science	10	Programmed text; slide/sound programmed text; computer
Electives	15	Programmed text; computer
Continuing Education programs	100*	Audio-Cassette
Graduate Programs	5	Programmed text; slide/sound programmed text; computer

* of Subscribers

The teaching media and self-instructional programs are just beginning to catch hold as part of the educational methodology. Existing programs have been successful as evidenced by their continuation and by their expansion. Lack of physical space, audio-visual equipment, and supportive personnel have hampered our effort in this direction. The concentration of our present resources into the Learning Resources Center and the utilization of an audiovisual coordinator have greatly aided our present programs. This, however, is barely covering present demands and with the success and anticipated expansion of innovative teaching programs, the demand will be much greater in the near future.

B. Planned

The existing pharmacy library will be incorporated with the Biomedical Library in the new complex. This will serve the School of Medicine, School of Public Health, School of Nursing, School of Dentistry, University Hospitals, College of Biological Sciences, and users of biological and medical library materials within the University as a whole, along with the College of Pharmacy. This total incorporation allows for an enlarged resources base, as well as avoiding needless duplication of collections.

As part of the Unit B/C expansion, the Learning Resources Center within the Biomedical Library will be expanded to accommodate approximately 160 individual carrels, 15 small group carrels (3-4 people), 2 interaction rooms accommodating 24 individuals, and a general study area (approx. 55 spaces). In addition, the College of Pharmacy is providing 16 additional individual carrels, along with numerous seminar/conference rooms and general study spaces based on the decentralized concept.

At the college level, these learning resources materials will be coordinated through the Educational Development Center. This service will be actively available for undergraduate, graduate, and continuing education programs. Incorporated will be expertise in teaching methodology, curriculum planning, counseling procedures, and audio-visual production techniques. This Center will in turn utilize the University and the Health Sciences educational and production resources, again avoiding needless duplication.

Use of CCTV, audio-visual aids, computer teaching, and self-instruction methods will increase significantly with the availability of new facilities. These methods are being introduced to our faculty at the present time as can be seen by the tabular presentation in Part A, Number 5 (current Library and Learning Resources). These methods have been accepted and are increasing in use. Although our present resources are being taxed by this increased utilization, the methodology and interest must be encouraged now to allow for immediate appreciation and utilization in the new facility.

In addition, the much closer proximity of the Biomedical Library and its many services (e.g., MEDLARS, Medline, inter-library loans) to the College will encourage their utilization.

VII. NATIONAL HEALTH OBJECTIVES

A. Special Programs

1. Training Courses in Current Shortage Disciplines

The extended health care roles proposed for future pharmacists and which are now being established have required extensive changes in the curriculum. This has led to the development of a philosophy for clinical pharmacy education that fosters application of basic health and pharmaceutical sciences in the environments in which pharmacy is being practiced.

Although a critical shortage of practicing pharmacists has not been identified. There is a shortage of pharmacists with the clinical expertise needed to function in the expanded role capacities now being defined. The profession of pharmacy is clinical by its very nature and thus all students must be appropriately trained, including the current practitioner through continuing education programs. The College of Pharmacy is committed to this concept.

The College does not believe that for all students this clinical training requires 6 years of formalized education as is found in the Pharm. D. degree program. In fact a majority of the needs for our health care delivery system in regard to drug use control can be actualized through the Bachelor of Science graduate who has had appropriate training in clinical areas in addition to the basic health and pharmaceutical sciences curriculum.

The 6-year Doctor of Pharmacy degree program was initiated in response to the growing demand for highly trained pharmacists prepared specifically for clinical practice in patient care environments. While all pharmacists are becoming more patient oriented, those practicing in hospitals, clinics, nursing homes, and similar institutions must work in close cooperation with physicians and nurses if the best in patient care is to be achieved. This implies a more intensive training in areas of specialization. The Pharm. D. graduate is a clinical specialist with this more refined expertise.

An example of the specialization option for the Pharm. D. in "applied clinical pharmacology" will serve to indicate the potential of this program. There is great demand for the Ph.D. - M.D. Clinical Pharmacologist to aid physicians in selection and use of drugs to treat disease states. However, the research oriented Clinical Pharmacologist is more concerned with the evaluation of drugs in human beings, an endeavor which takes advantage of his unique expertise, than with direct patient care. Further, the very long and expensive preparation of the Clinical Pharmacologist makes their continued shortage virtually assured. Projections indicate that there will be insufficient Clinical Pharmacologists even to meet the needs for educational health centers in the next couple decades. Role model evaluation, although preliminary, suggests that our Pharm. D.'s can be prepared to serve the health institution needs as an applied clinical pharmacologist. We have indications that hospitals in the metropolitan area are desirous of having this kind of person on their staff as a therapeutic consultant. The need is even greater when one

attempts to fulfill the soon to be identified need of the numerous hospitals outside the metropolitan areas. Further, we are working with the State of Minnesota in establishing this kind of service in all its hospitals including the supportive pharmacotherapeutic laboratory. The need for this one Pharm. D. specialist alone in the upper midwest may prove staggering.

In addition the drug information specialist will provide for a variety of shortage areas with several more in the explorative/definition stage. Inclusive in these shortage areas are:

- A. Clinical teaching roles - Our Pharm. D. graduates are sought for academic positions in other schools of pharmacy. The current American Association of College of Pharmacy listing of openings for clinical staff is 103.
- B. Therapy advisors for specialized medical areas - one local hospital has one of our graduates working specifically with the staff in a burn unit. Pediatrics and mental health are other examples.
- C. Directors of Drug Information Center - As the operator of a DIC serving Minnesota, we now offer an option in this area.
- D. Poison Control Center - A College Faculty member directs the PCC for Hennepin General Hospital in Minneapolis. It will serve as a training for interested students.
- E. Community Pharmacies (HMO, Nursing Homes, Group Practitioners). Role models are being evaluated in a) Community Pharmacy in a suburb; b) metropolitan community pharmacy with a large nursing home responsibility; c) nursing home pharmacy; and d) a group medical practice with an in house pharmacy.

The College's commitment to this training can be noted by the present commitment of resources to clinical faculty. We are prepared to commit additional resources to clinical component as the acquisition of the proposed facility permits the increase of students entering the Pharm. D. program.

The clinical pharmacy program consists of a core of basic behavioral and clinical knowledge as part of the education of all pharmacy students. This is followed by sequenced study and training in which the student selects certain elective offerings designed to provide the opportunity to pursue more intensive study in those areas of greatest interest to him.

The courses offered can be separated into three distinct groups. The first group encompasses those courses which are required of all pharmacy students. This includes socializative and administrative orientation covering the general concepts in dealing with people and the application of these concepts (along with basic pharmaceutical knowledge) to a clinical (or people) situation. The second group encompasses courses which are elective in nature and are meant to provide depth to the basic clinical knowledge and experiences. The third group provides the basis for the Doctor of Pharmacy degree.

A fourth group can be added which covers continuing pharmacy education. Up until approximately seven years ago the pharmacy student was not exposed to clinical situations. There is therefore, a large population of pharmacists in need of updating in this particular area. The College is committed to providing this continuing education need.

Recently, a new proposal for hospital based clinical education was developed. This proposal is based on the need for the student to be exposed to direct decision making involvement in patient care. This would be

facilitated by formulating a learning hierarchy in which faculty are responsible for Pharm. D. residents who in turn are responsible for senior students who are responsible for junior students. Each person in this hierarchy has specific responsibilities for patient care and each is involved in teaching-learning. This experience, if instituted, would replace our clinical conferences and some of the clerkships. It should be pointed out that this is a long range proposal and as such is purely in the speculative scope of our program as seen for the next several years. The new integrated facilities would most certainly promote the establishment of such a concept.

2. Interdisciplinary Training

The Health Sciences Center concept promotes interdisciplinary training. The College of Pharmacy is actively committed to this rationale.

The Basic Health Sciences (e.g., Pharmacology, Physiology, Pathology, Microbiology, and Anatomy) are taught by the Medical School and are common components of each unit's curricula. The beginning of the pharmacy student's participation in these areas is during his third collegiate year (first professional year) and thus interprofessional cooperation can be noted early in his professional schooling. The intent of this approach is to maintain a critical mass in each of the disciplines for graduate studies and research. This is successful; however, we have not found the optimal solution to the basic health science contribution to the various professional programs. The Health Science Center administration has this as a priority matter.

We do have offerings from the School of Public Health and the College of Veterinary Medicine as a part of the elective programs of our college. The Pharm. D. Program utilizes the Phase B sequence of the Medical School (taught on the argon system approach) and adapts it into the 24 credit Pathophysiology and Therapeutics Course.

Specific interdisciplinary efforts need brief mentioning. They are:

A. Drug Information and Education Program. The College is responsible for DIEP for the University of Minnesota system including the Twin Cities campuses and the four out-state institutions. As such the College a) offers a variety of drug education courses to students in health sciences and in non-health sciences; coordinates the offerings where more than one educational unit is involved (Pharmacy, Education, Law, Public Health, etc.); c) develops and supports educational and informational offerings of out-state University divisions; d) coordinates the drug education and information activities of all agencies, including the departments of state government (not yet completely successful); and e) operates a drug information services center housed in the College (needs a great deal more space).

B. Pharma SYST. A Center for the Study of Pharmaceutical systems has been established in the College of Pharmacy. It is devoted to the study of the provision, utilization, delivery, and outcome of pharmaceutical and all other health care services. An interdisciplinary group of people having special experience in basic qualitative research skills has been assembled to study the planning, management and evaluation of health care services. The mission of the center will be to strive toward the development, testing, and

dissemination of information relating to the provision of the highest quality optimally accessible and least cost health care services with particular attention paid to pharmaceutical services. The objects of study are seen as pharmacy and its associated disciplines, interests and related functions and equally, drugs, in the many perspectives in which they are prescribed, used, and transferred, as well as the provision, need, assessment and analysis of all health care services. Such interests include attitudinal matters from a point of focus of the prescriber, organizer, government payer and the manufacturer, seller, and patient, including also economic and other social science perspectives. The center will seek its own support, contract to produce instructional resources and act as a broker to package appropriate mixes of administrative, economic, educational, behavioral, biological and physical scientists to undertake the conduct of its endeavors. Those things learned through the Center studies will be used to aid the faculty in its constant reevaluation of a dynamic curriculum.

C. The College alone and with others offers courses for students in other units. Included are

1. Death and Dying. A course developed by the faculties of the College of Pharmacy and the School of Nursing for health science students.

2. Drugs and the Elderly. A course developed by the College of Pharmacy Faculty for students in the Health Sciences.

3. Terminology of Health Sciences - a course developed by the College for any student in the University.

4. Advanced First Aid - A course offered by the College primarily to health science students but not restricted to them.

5. Others include Drug Abuse and Society, Pharmaceutical Immunology, Physiological Disposition of Drugs, Nature's Remedies, and Drug Abuse Workshops. The audience is varied.

The Health Sciences Education Policy Committee is now working on a plan to develop a selection of interdisciplinary courses.

There are, in addition, many other courses of an interdisciplinary nature at the graduate school level.

Another common link between all health science areas at the clinical education stage is the University Hospitals (and clinics) which serve as the primary experimental base for all health sciences students. In addition, a majority of the institutional clinical sites utilized by the College of Pharmacy also train students from other health sciences disciplines. The future plans of the College to develop satellite units in the hospital affiliated with the medical schools @ Rochester and Duluth will provide further impetus toward the concept of the interdisciplinary health team, as will the Rural Pharmacy Associates Program working in conjunction with the Rural Physicians Associate Program. Funding for both approaches is expected from the 1975 Legislature.

College of Pharmacy faculty work with the other units in providing manpower, lectures, materials, and information for undergraduate and graduate studies as well as through research cooperation. Included in the research areas are the following cooperative endeavors:

* Collaborative study with the Oncology Department of the University of Minnesota's Masonic Cancer Hospital;

* Collaborative study on affinity labeling of analgesic receptors with

the Department of Pharmacology;

- * Working with the Department of Pharmacology to train students in the necessary surgical procedures and set-ups needed to measure NMJ blockade and blood pressure;
- * Collaborative study on animal nutrition;
- * Collaboration with the Hormel Institute on a variety of projects;
- * Screening programs for anti-microbials with 3-M;
- * Collaboration on an allergy project with the University Hospitals, Medical School, and 3-M;
- * Collaboration with the Department of Pharmacology on cyclic AMP-GMP interaction for cell differentiation and proliferation;
- * Joint research project with the College of Dentistry on the mechanism of the reaction of flouride salts with synthetic tooth mineral hydroxyapatite;
- * Collaboration in drug utilization review;
- * Collaboration with the State Comprehensive Health Planning Agency on studies of the future of various aspects of the health care delivery system in the State of Minnesota; and
- * Development of a consumers guide to pharmaceutical services with the Minnesota Public Interest Research Group.

The above listing is not inclusive and is only meant to convey the scope of the interdisciplinary research programs that are currently underway. Again, it should be emphasized that these research activities are an integral part of our graduate training program.

It is important to recognize that the College has reorganized administratively to promote the interdisciplinary concept. All disciplinary departments have been replaced by the units of Drug Action, Drug Delivery and Professional Practice in the Professional Studies Division. Under this approach, individual faculty members contribute to any and all units where they have expertise.

The Continuing Pharmacy Education program has been particularly active in interdisciplinary types of training. Included in these activities for this year alone are:

- * Cooperation with all health disciplines in the preparation of the television lecture series and the audio-cassette programs;
- * An I.V. Therapy Seminar for Pharmacists and nurses;
- * A programmed instruction program: Treatment and Care of Diabetics; and
- * The Conference on Current Clinical Concepts in Cancer, Radio-Isotopes, and Immune Systems

The interdisciplinary nature of the presentations has been most successful and will be continued and expanded in the future.

Indicative of interdisciplinary involvement is CHIP (The Council for Health Interdisciplinary Participation). Comprised of students from all health science disciplines, this group promotes the students' community involvement; e.g. drug abuse programs, venereal disease programs, and free clinic participation. The students of the College of Pharmacy have been particularly active through the Drug Information-Community Drug Education Program.

The proposed facility will of course benefit all aspects of interdisciplinary training. Although the exact details of joint utilization have yet to be worked out, there will be interdisciplinary usage of laboratory space by the medical technology group. This will not only integrate the student body to a greater extent, but it will provide greater efficiency in the utilization of building space.

3. Distribution of Health Professions Personnel

A "Survey of the 1957-1967 Graduates of the University of Minnesota College of Pharmacy (Minnesota Pharmacist, April, 1969) by Netz and Grussing revealed that of the 397 graduates, 292 (73.6 percent) resided in Minnesota and 99 (24.9 percent) lived in other states. A survey by the Minnesota Alumni Association in 1967 (Alumni News, U. of Minnesota, Jan. 1969) showed that 76.7 percent of alumni of the College of Pharmacy were living in Minnesota. This compared with 69.3 percent for Dentistry and 50.4 percent for Medicine.

While distribution has not proved a serious problem for pharmacists in Minnesota, we recognize that potential and are trying to develop corrective measures which will prevent a shortage in rural or deprived areas.

The College of Pharmacy is working closely with the Department of Family Practice and Community Health of the Medical School to establish the Rural Pharmacists Associates Program as a program paralleling the established Rural Physicians Associate Program. It is anticipated that the legislature will fund both programs permitting the program to be initiated during the 1975-76 academic year. During the present academic year, the College has funding from AHEC to do an experimental program. This is underway at this time. This program will mean an interdisciplinary approach to education for the College of Pharmacy and the School of Medicine.

The College has been experimenting with a structured externship for past year. The new externship program utilizes community and hospital pharmacy sites well distributed throughout the state. All students in the 1976 graduating class are being assigned to these sites for a minimum of one academic quarter. This program will introduce some students to the rural area for the first time.

The College is experimenting with role model development in rural areas through a grant from the Area Health Education Center program. An attempt is being made to establish expectations of the pharmacist in a rural city with a) a pharmacy but no physician or hospital; b) a pharmacy and a physician but no hospital; and c) a pharmacy only. We are particularly interested in the expanded roles of the pharmacist in primary health care.

The emphasis being placed on the clinical aspect of community pharmacy will hopefully promote an understanding of the needs, wants, and relationships occurring in the smaller communities. This sensitization could not occur with a clinical component that was exclusively institutionally based. Biases toward the institutional setting and misunderstandings about the role of the community pharmacist undoubtedly would have developed.

In an attempt to encourage a more active liaison between outstate communities and graduating health professionals, the Health Sciences Center promotes an annual Minnesota Opportunities Day for the Health Sciences. Representatives from many outstate communities are present and have the opportunity to present information about their community and their health care needs to the graduating professionalⁱⁿ all health professions!

The School of Dentistry has developed a computer based placement system. Detailed information on every community (population, schools, health professionals, recreation, ethnic groups, etc.) is stored. This has now been expanded to include the special needs of all the health professional units. Students can obtain detailed information on areas having need for their services. In addition, the community can make their needs known and prospective health professionals are informed.

Distribution of pharmacy practitioners has been much dependent on the role definitions and responsibilities associated with any given setting. As role definitions are expanded and as these concepts are transported to all pharmaceutical service delivery sites (urban and rural), the manpower distribution problems between urban and non-urban areas will be eliminated or prevented. The College of Pharmacy is committed to the development and demonstration of these expanded responsibilities of the pharmacist which would strengthen our health care delivery system.

4. Health Professions' Auxiliaries Training

The College of Pharmacy has been involved in a unique demonstration project involving two community pharmacies with a publicly financed health center. One of the objectives was to train community residents as paramedical personnel so that they may assume responsibility for community drug information and education.

Pharmacy's contribution to this training would have the following scopes:

- a. Lecture and discussion of the pharmacist's role in the health care delivery system -- the pharmacist as a resource to paraprofessionals.
 1. Systems used to monitor frequency of drug use
 2. Dosage form design and modification. Sterility, packaging, storage.
 3. Source of drug supply.
 4. Drug information and interactions.
- b. Drugs - what are they? Why people take drugs.
- c. Rationale of regulatory control of drug distribution
- d. Side effects of drugs.
- e. Drug pricing.
- f. Counsel paraprofessionals on how to teach patients about drugs.
 1. When and how much.
 2. How to spot difficulties.
 3. Appropriate use of over-the-counter drugs.
- g. Taking drug histories.
- h. Consumer Health Education (Preventative).

While this program has not met our expectations, we have learned a great deal that will be useful in two additional commitments. They are:

- a. Community-University Health Center - This center has been moderately active in a target neighborhood for several years. The University Health Science Center has a commitment to develop this center as a multiprofessional education center. The units are in the process of staffing and completing programs. It should be operative in this expanded state before the end of summer, 1975.

b. B-C Outpatient Clinic. As one of the requirements for a "Certificate-of-need" for the addition to the School of Medicine, a requirement by the Comprehensive Health Planning "B" Agency was made that the Health Sciences Professional Schools would develop an educational unit which would utilize all the health professionals in a "health team" approach. Representatives of the "B" agency and the U of M Health Sciences Center are now working to identify the area in which the Clinic will be established. The College is presently searching for a Pharm. D. to participate in this program.

The College is also an active participant in the health Sciences Allied Health Committee. This group plans and initiates directions and opportunities for the training of paraprofessionals.

The Educational Policy Committee of the College of Pharmacy appointed a Task Force on Subprofessionals in Pharmacy which is currently active. Their role is to assess the possible alternatives and directions on this question. The College has completed an explanatory study on the need for the Pharmacy Technician. This study concerned community pharmacies, Hospital Pharmacies and Large-Scale Pharmacy Operations. We are now working with the State Education Department. It would appear that such a program will be implemented in one of the out-state colleges in the near future.

A program on "Drugs and the Elderly" is scheduled for funding by Title this year. As a result we will expand the program beyond the course which is being offered to all health science students. We will develop drug education programs for the elderly. The service component which is presently a joint effort between social workers and pharmacy students will be expanded to include the community pharmacy. At present social workers identify drug problems and pharmacy students then consult and advise these elderly patients.

B. Complementary Programs

1. Regional Planning and Coordination

The College has been deeply involved in State and local health programs. These may be enumerated as follows:

a. State Comprehensive Health Planning -

* A faculty member was chairman of the "a" agency advisory council for several years and continues serving as a member of the same council

* A Ph.D. candidate in pharmacy administration is cooperating with the state agency on a long-range planning project using futures methodologies in order to attempt to define the future parameters of the health care delivery system in the State of Minnesota.

b. Metropolitan Health Board -

* A faculty member participated in the organization of the "b" agency and the College continues to work with them through a community pharmacist representative and through a representative from the School of Public Health.

* The College, through the Department of Pharmacy Administration, has prepared an extensive document and provided testimony at a hearing meant to define the content of the "Health Chapter" of The Metropolitan Development Guide.

* Pharmacy Administration graduate students will be participating in residency training periods with the Board, working on a variety of projects.

c. Regional Medical Program -

* A part-time clinical faculty member was on RMP's advisory board.

- * The College has worked very closely with the RMP staff on several grant applications, including one on rural health care delivery.
 - * RMP funded our expanded Drug Information Center into an integrated Medical Information System serving the entire State of Minnesota.
 - * RMP has funded an extensive hypertensive program involving pharmacists and physicians with our faculty.
- d. Area Health Education Center (Programs mentioned elsewhere)
- * Close cooperation characterizes the relationship between AHEC and the College. Faculty and Students have been involved with a variety of interdisciplinary community based projects.
 - * Grant proposals outlining expanded role functioning of the pharmacist in the rural health care setting and relating this to the clinical component of the pharmacist's training are currently being prepared.
- e. Community Health Programs - the College is involved in a number of health related programs. These include:
- * A joint effort with the Ramsey (county) Action Program to develop a Neighborhood Health Center in West St. Paul, the College being responsible for the drug component.
 - * The College works with the Helping Hand Health Center (St. Paul) in effectively using community pharmacies in the area served to improve pharmaceutical services and serve as an outreach for the Center for entry into the health care system.
 - * The pharmacy students of the College have been involved with the development and operation of the "free" clinics in the metropolitan area.
 - * The College has a sound drug education program operated by students and staff concerned with drug use, abuse, and misuse for citizens of all ages. This also involves consumer health education.
 - * The College operates the pharmacy in the Stillwater State Prison on contract. It is used as an educational unit. Equally important, an attempt is being made to develop a model pharmacy operation for prisons.
 - * The College is involved in Health Maintenance Organization development. They are seeking a contract jointly with St. Paul Group Health to evaluate pharmaceutical services in an HMO.
 - * Demonstration projects are currently being developed which will evaluate the effectiveness of a "consulting" (non-dispensing) pharmacist in the community clinic setting.
 - * A pharmacy fraternity has developed an effective and successful venereal disease speakers bureau.
 - * A blood pressure screening project is currently being developed and will soon be at the demonstration stage.
 - * An active education and service program deals with the special needs of the elderly, especially as they relate to the use of drugs--both prescription and non-prescription.
 - * A College group has developed a program on Family Planning.

f. Drug Abuse Education Programs

* The College directs the University's Drug Information and Education Program which includes the Drug Information Service Center.**

* The College cooperates closely with the Health Professionals Drug Abuse Education Project which is attempting to provide some of the much needed information about drug abuse to health care professionals practicing in the community setting.

* The College maintains a Drug Information - Community Drug Education Program which provides manpower and other resources to numerous community groups and other sectors of the University.

g. Faculty members of the college are involved with a number of health related organizations serving the people of Minnesota.

It should be emphasized that many additional projects are in the planning stage. Lack of resources (personnel and dollars) has been the inhibiting factor to date.

The proposed project will promote state and regional health objectives through increased enrollments, improved clinical training for pharmacists, facilitating the training of clinical specialists, increased interdisciplinary cooperation, facilitation of a sound health care delivery system, and the promotion of the health care team concept in health services delivery.

Letters representing the current backing of the project from the state (a) and the regional (b) planning organizations are included on the following pages. Also included are the letters of support written for the 1972 and 1974 application, indicating longitudinal consistency in terms of health planning policy.

** Included in the appendices following the body of this application is a reproduction of a booklet entitled A Guide to University of Minnesota Activities in Response to the Problems of Chemical Misuse and Abuse. This booklet gives an excellent overview of the activities coordinated by the Drug Information and Education Program (see Appendix C, pages 228-261).



STATE OF MINNESOTA

STATE PLANNING AGENCY
100 CAPITOL SQUARE BUILDING
550 CEDAR STREET
ST. PAUL, 55101

March 13, 1975

Mr. Clinton T. Johnson
Assistant Vice-President
Business Administration and Treasurer
Morrill Hall
University of Minnesota
Minneapolis, Minnesota 55455

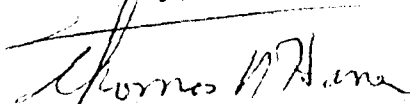
RE: Unit F - University of Minnesota Health Sciences
SCH # 75031304

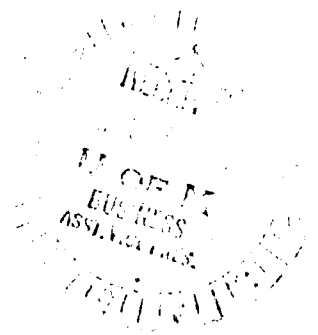
Dear Mr. Johnson:

This is to certify that the Minnesota State Planning Agency has in accordance with the Project Notification and Review System (PNRS) procedures, established by the Office of Management and Budget Circular A-95, reviewed the Unit F - University of Minnesota Health Sciences proposal noted above. State agencies which may be interested in or affected by this proposal have been notified by our office.

This letter represents the final action of the State Planning Agency's review of the proposal in its performance of the function as the State Clearinghouse under the PNRS procedures. University of Minnesota is, therefore, authorized to submit its application without further notice or review by this agency. A copy of this letter should be attached to said application.

Sincerely,


Thomas H. Harren
State Clearinghouse



300 Metro Square Building, 7th Street and Robert Street, Saint Paul, Minnesota 55101 Area 612, 227-9421

February 28, 1975

Mr. Clinton T. Johnson
Assistant Vice President
Office of Assistant Vice President and Treasurer
302 Morrill Hall
Minneapolis, Minnesota 55455

RE: Unit F - College of Pharmacy - School of Nursing
Metropolitan Council Referral File No. 2500
Primary Care Clinic
Metropolitan Council Referral File No. 2501
Community University Health Care Center
Metropolitan Council Referral File No. 2502
Smiley's Point Family Practice Clinic
Metropolitan Council Referral File No. 2503
Chicago Avenue Family Practice Site
Metropolitan Council Referral File No. 2504
Basic Science Remodeling
Metropolitan Council Referral File No. 2505

Dear Mr. Johnson:

The University of Minnesota project notification for HEW funds to assist in the projects described above were received by the Metropolitan Council on February 18, 1975.

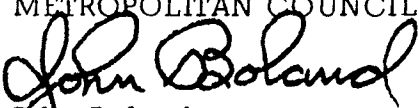
These projects will be reviewed in accordance with procedures of the Office of Management and Budget which require that the Council notify potentially affected units of government, neighborhood organizations, and human rights commissions and inform them that they have an opportunity to comment upon these projects.

Mr. Clinton T. Johnson
February 28, 1975
Page Two

Should the Council need more information before completing the review, the staff will write or call your office.

Thank you very much.

Sincerely yours,

METROPOLITAN COUNCIL

John Boland
Chairman

JB:emp

cc: Thomas Harren, Office of Local and Urban Affairs, State Planning Agency
Ms. Joan Campbell, Metropolitan Council District 6
Alton J. Gasper, Metropolitan Council District 8



STATE OF MINNESOTA

STATE PLANNING AGENCY
100 CAPITOL SQUARE BUILDING
550 CEDAR STREET
ST. PAUL, 55101

March 21, 1974

Dr. Lawrence Weaver
Dean, College of Pharmacy
University of Minnesota
115 Appleby Hall
Minneapolis, Minnesota 55455

Dear Dr. Weaver:

The State Comprehensive Health Planning Advisory Council adopted the position given below at its March 20, 1974 meeting.

The State Comprehensive Health Planning Advisory Council is familiar with the proposed expansion of the University of Minnesota Health Science Center. They encourage the emphasis being placed on the health team approach and the additional involvement with the community by the Center. The proposed expansion is not in conflict with programs being developed by the state agency.

The College of Pharmacy is the only school for this profession in the state. The need for this facility is recognized by the Council, and they strongly support its development.

We recognize the efforts of the University of Minnesota Health Science Center to assist in improving health care for all Minnesotans in particular and citizens in the upper midwest in general.

Sincerely,

Vernon L. Sommerdorf, M.D.

Vernon L. Sommerdorf, M.D.
Chairman
State Comprehensive Health Planning
Advisory Council

VLS:ks



300 Metro Square Building, 7th Street and Robert Street, Saint Paul, Minnesota 55101 Area 612, 227-9421

March 29, 1974

Mr. Lawrence C. Weaver, Dean
College of Pharmacy
University of Minnesota
115 Appleby Hall
Minneapolis, Minnesota 55455

RE: Unit F Health Sciences Complex
Metropolitan Council File No. 781

Dear Dean Weaver:

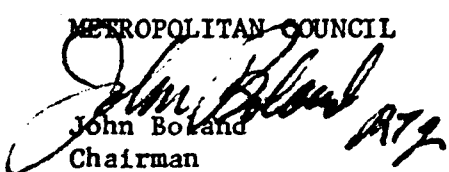
At its meeting of March 28, 1974, the Metropolitan Council considered your application for National Institute of Health funds to aid in the construction of a nine-story health sciences center (Unit F).

This project was previously reviewed by the Council in September of 1971. There have been no significant changes in the project since that time.

The Council finds that this project is not inconsistent with Metropolitan Area development plans and goals and recommends funding of this project.

Sincerely,

METROPOLITAN COUNCIL


John Boland
Chairman

JB:pap

cc: Bruce Bredeson, Metropolitan Health Board Staff



STATE OF MINNESOTA

WENDELL R. ANDERSON
GOVERNOR AND
STATE PLANNING OFFICER

Gerald W. Christenson
State Planning Director

STATE PLANNING AGENCY
802 CAPITOL SQUARE BUILDING
550 CEDAR STREET
ST. PAUL, 55101

May 22, 1972

Vice President Lyle A. French
Health Sciences Affairs
424 Morrill Hall
University of Minnesota
Minneapolis, Minnesota 55455

Dear Dr. French:


The Advisory Council of the State Comprehensive Health Planning Agency adopted the position given below at its meeting May 17, 1972.

The Advisory Council of the State Comprehensive Health Planning Agency is familiar with the proposed expansion of the University of Minnesota Health Sciences Center. They encourage the emphasis being placed on the health team approach and the additional involvement with the community by the Center. The proposed expansion is not in conflict with programs being developed by the state agency.

Units A and F are facilities for dentistry and pharmacy, respectively. They are the only schools for these professionals in the state. The need for these facilities is recognized by the Council, and they strongly support their development. The BC unit is for medicine and is likewise supported. However, the Council recognizes that certain parts of the BC unit are subject to Certificate of Need legislation to be evaluated by the appropriate "b" agency.

We recognize the efforts of the University of Minnesota Health Sciences Center to assist in improving health care for all Minnesotans in particular and citizens in the upper midwest in general.

Sincerely yours,


Lawrence C. Weaver, Chairman

**METROPOLITAN
HEALTH
BOARD**



300 Metro Square Building, 7th Street and Robert Street, Saint Paul, Minnesota 55101 Area 612, 227-9421

June 7, 1972

Lawrence Weaver, Dean
College of Pharmacy
University of Minnesota
Minneapolis, Minnesota

Dear Mr. Weaver:

The University of Minnesota project notification for National Institutes of Health funds to assist in the construction of Unit F (to house the College of Pharmacy) was originally received by the Metropolitan Council for review on June 1, 1971.

In accordance with Federal procedures, units of local government were notified of the project and given the opportunity to comment on the project. Additionally, staff reviewed the project for compatibility with guidelines for development of the Metropolitan Area.

Based on the above process and review, it was concluded that: 1) this unit is needed to provide additional teaching and research space for the College of Pharmacy, and 2) this project does not conflict with any present guidelines for total Metropolitan Development.

As the project remains the same as proposed a year ago, it is felt that the previous conclusions are still germane.

Sincerely,

A handwritten signature in cursive script that reads "Malcolm Mitchell".

Malcolm Mitchell
Acting Director

MM:lh

RECEIVED
JUN 8 1972
COLLEGE OF PHARMACY

2. Interinstitutional Participation in Training Programs

The University of Minnesota is a participant with the other "Big Ten" schools and the University of Chicago in the Committee on Institutional Cooperation (CIC). This group promotes interinstitutional cooperation for a variety of educational and service roles. Most notable is the Traveling Scholar Program for graduate students enrolled in CIC institutions. This program enables a graduate student to travel to another of the member institutions for 1 or 2 quarters (1 semester) of study to take advantage of special resources available on another campus but not available on his own. This may include course offerings, research opportunities, unique laboratories, and library collections. This allows for program enrichment and diversification.

For the past seven years, the University of Minnesota College of Pharmacy has provided leadership for a panel on Continuing Pharmacy Education sponsored by the CIC. Seven schools of Pharmacy have participated.

Following CIC guidelines, a cooperative program in continuing education has been developed utilizing audio cassette tapes as the media. Thus far, four schools (including Minnesota) have produced programs. These programs will be jointly advertised as a first example of interinstitutional cooperation in Continuing Pharmacy Education. Hopefully, this can expand to the national level so that duplication and poor quality in continuing education software can be avoided and so that pharmacists nation-wide can benefit from a given institution's strong points.

The College of Pharmacy is an active member of the American Association of Colleges of Pharmacy (AACP). This group, comprised of all accredited Colleges of Pharmacy, promotes interinstitutional cooperation on a national level. This organization's immediate past president is Dean of the College of Pharmacy at the University of Minnesota. Three major projects of the organization currently underway are:

- * A study of pharmacy manpower;
- * Development of a Pharmacy College Admission Test; and
- * Formation of the Study Commission on Pharmacy to look at the directions being taken by pharmacy and to make appropriate recommendations.

3. Health Care Delivery

a. Team Approach to health Care Delivery:

The College of Pharmacy is an active participant in the planning and implementation of several programs involving the health care delivery team approach.

* Structured externship program - The College has developed an externship program that will expose the student to health care in a community pharmacy and a hospital pharmacy. All students will be exposed on a full time basis for one full quarter. An additional elective quarter is also available. It is anticipated that this educational experience will improve the Pharmacy practitioner and the Pharmaceutical services of the Pharmacy.

* Clinical program - Through the clinical conferences, clinical clerkships, and clinical residencies, the student is exposed to the actual health care delivery system and how he is a part of it. At the same time the medical students, nursing students, interns, residents, practicing physicians, registered nurses and paraprofessionals are exposed to the pharmacist, his knowledge, and what he has to offer to total patient care. Students are assigned patients and follow them closely. They go on rounds and consult with

other health professionals. The outline of the program course schedule has been included in the current curriculum section of this application as have been the elective options available. The College's program is based on clinical faculty members, the majority of whom are practicing pharmacists in their respective environments. They provide the point of entrance for the student into the health care delivery team environment and also provide the continuity needed for the program. The program director who is based at the College, works closely with the principals at each of the clinical sites in developing the optimal program.

* Free Clinics - The College of Pharmacy promotes the concept of its students working with other health professional students and health professionals in the innovative health care delivery systems found at the free clinics. Here, the pharmacy students are working with a wide variety of health care personnel (physicians, nurses, med techs, veterinarians, social workers, patient advocates, psychiatrists, etc.), as well as with community workers who are deeply committed to the welfare of community members. The College does not provide personnel, planning or coordination - this is a task for the community and the volunteers - but it does provide its support.

* Community health programs - These have been listed in an earlier section of the application. These programs are similar to the two listed above in that pharmacy personnel are working closely with other health professionals in the delivery of health care. Innovations include the utilization of existing community pharmacies in an experimental health care delivery system (Helping Hand Clinic) and the education of community residents as paramedical personnel.

* Student Involvement - Involvement in CHIP (Council of Health Interdisciplinary Participation), Speakers bureau presentations on drug abuse and venereal disease, and other joint projects all increase the interdisciplinary interactions between health sciences students.

* Area Health Education Center experimental programs on role model development places the student in an environment where other health students and practitioners practice.

* Rural Pharmacy Associates Program - The Proposed program to coordinate pharmacy student placement with medical student placement under the Rural Physicians Associates Program will provide greater mutual understanding between the two disciplines while at the same time providing a service to the rural population of the state.

* Satellite units at Rochester and Duluth - In order to create a truly interdisciplinary health care team, programs must involve those health care training institutions that do not have pharmacy programs. The Mayo School of Medicine at Rochester and the Duluth branch of the Medical School are examples of this type of institution. The decision to train pharmacists during their clinical phase at these two institutions will most certainly foster the interdisciplinary team approach to health care delivery (through involvement of both resident faculty and students). In addition, such utilization of these sites will provide a stronger link between the educational environment and the small community/rural setting. It is expected that this program will be funded in the 1975 legislature.

Unit F (College of Pharmacy) will be an integrated part of the Health Sciences Center. The physical intermingling between health sciences students that this will provide, along with the interdisciplinary courses offered, will do much towards the goal of the health care team. This recognition of interdependency must begin in the learning years if our system is to develop along these lines.

b. Health care delivery demonstration projects:

The College is committed to research involving our health care delivery patterns. There are recognized deficiencies in our system, ranging from under-utilization of valuable manpower to a maldistribution of health care access points.

Numerous demonstration projects are underway or are in the planning stages. Included are:

- * A demonstration of the role of a consulting (non-dispensing) pharmacist in the HMO setting;
- * A demonstration of the role of a consulting (non-dispensing) pharmacist in a small group medical practice;
- * A demonstration of the expanded role capabilities of the rural pharmacist, particularly in communities with no other readily available health care resources; and
- * Several demonstration projects dealing with the use of the computer in the health care setting, particularly as it relates to drugs and drug use.

4. Other Complementary Program Involvement

- * A clinical pharmacy faculty member has been appointed as clinical consultant for all State hospitals.
- * Several faculty members are active participants on state level committees dealing with continuing education and internship/externship requirements.
- * The College houses the offices of the Journal of Medicinal Chemistry (a national journal sponsored by the American Chemical Society) with the positions of editor and assistant editors belonging to faculty members. Other faculty members are on the editorial boards of a number of scholarly journals.
- * The chairman of the Department of Medicinal Chemistry is a member of the panel on drug development for contraceptives sponsored by the Institute of Child Health and Human Development of the NIH.
- * Another member of the faculty serves as a member of Medicinal Chemistry Study Section B, NIH, a consulting group used for peer review of research grant proposals.
- * Two faculty members are among the 30 pharmacy representatives on the Committee on Revision of the U.S.P.
- * Faculty members are members of National Advisory Food and Drug Committee of the Food and Drug Administration.
- * Numerous faculty members cooperate with other institutions and drug companies on a variety of projects.

The above listing is not meant to be inclusive but is intended to show the scope of complementary program involvement.

Of special interest is the establishment of the Center for the Study of Pharmaceutical Systems (PharmaSYST). Developed to study the provision, utilization, delivery, and outcome of pharmaceutical and all other health care services, the Center has the potential in working for numerous national health objectives. The Center is built around a core of teaching related activities at the College of Pharmacy and other institutions. See Appendix D (pages 262-269) for a reproduction of the PharmaSYST brochure.

VIII. STUDENTS

A. Number of Applicants and Number Accepted

Up until the 1971-72 academic year, no records were maintained by the College of Pharmacy as to the total number of applicants versus the total number of students accepted. In general, if the applicant qualified, he was accepted into the College. Until that point in time, our facilities had been able to adapt to these increases, but this is no longer true. Therefore, for the academic years 1968-69, 1969-70, and 1970-71, we may generalize by stating that the number of qualified applicants was equivalent to the entering class figures (see table below). It has been estimated that approximately 15% of all applicants have been rejected not because of lack of facilities but because of lack of qualifications.

<u>Year</u>	<u># of Applicants</u>		<u>Entering Students</u>	
	B.S.	Pharm. D.	B.S.	Pharm. D.
1969-70	94*	--	94	--
1970-71	96*	--	96	--
1971-72	162	15	112	8
1972-73	200	15	112	8
1973-74	250	35	123	10
Current (1974-75)	300	60	123	15

*Approximations

B. Geographic Distribution of Enrollees

The number of non-resident undergraduate students in the College of Pharmacy has remained at a relatively constant level of 12-13% of the total number of undergraduate students. One-third of these students come from the State of Wisconsin. Figures for the past five years and the current year are as follows:

UNDERGRADUATES

STATE	YEAR	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75
Arkansas							
California		1					
Hawaii		1					
Illinois		1			2	3	4
Indiana		1					
Iowa		1	1	1	1		
Michigan		2	1	1			
Nebraska		1	2				
New Jersey		1	1	1	1	1	1
North Dakota		1	2	1	1	1	1
Ohio				1			1
Oklahoma				1	1		
Pennsylvania							1
South Dakota		1			1		1
Virginia					1	1	1
Wisconsin		1	3	6	6	9	17
Wyoming							
Total Non-Resident		12	10	12	14	15	27
Foreign Students		2	3	5	6	8	19
Resident Students		236	243	264	291	350	334
TOTAL		250	256	281	311	373	370

GRADUATE

STATE	YEAR	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75
Alabama							1
California		1	Geographic				
Colorado			breakdown	1			
Connecticut			of students	1			
District of Columbia			not				
Hawaii		1	available		1	1	
Illinois			for this		1	2	3
Indiana			academic		1	1	
Kansas		2	year	1			
Kentucky							
Louisiana		1					
Massachusetts				1	1	1	
Missouri							1
Montana						1	
Nebraska					2	3	2
North Carolina							1
New York		1		2	2	1	
North Dakota		1		1			
Oklahoma					1	1	1
Oregon				1	1	1	3
Pennsylvania				1	1		1
Rhode Island		2		1	1		
Vermont		1		1	1	1	1
Washington					1	1	1
Wisconsin		1			2	2	2

(Cont'd)

GRADUATE

STATE	YEAR	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75
Total Non-Resident		11		11	16	17	19
Foreign Students		19		18	21	23	24
Resident Students		9		12	18	15	23
	TOTAL	39	42	41	55	55	66

C. Minority and Disadvantaged Students

Grouping YEAR	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75
Total Under-graduates	250	256	281	311	348	370
Male	203	201	195	218	245	246
Female	47	55	86	93	103	124
Minority	2	4	4	4	4	6

For the current (1974-75) academic year:

Class Year	<u>SEX</u>		<u>ETHNIC BACKGROUND</u>				
	Male	Female	Black	American Indian	American Spanish Surname	Asian Americans	Other
1st	77	46	--	1	--	--	10
2nd	87	40	2	--	1	--	4
3rd	82	38	1	1	--	1	5
4th	22	1	--	--	1	--	--
Grad	50	16	4	--	--	1	24

D. Admissions Policy

The University of Minnesota is guided by the principle that there shall be no difference in the treatment of persons because of race, sex, creed, color, or national origin and that equal opportunity and access to facilities shall be available to all. This principle is particularly applicable in the admission of students in all colleges, and in their academic pursuits. It is also applicable in University-owned or University-approved housing, in food services, student unions, extra-curricular activities, and all other student services. It is a guiding policy in the employment of students either by the University or by outsiders through the University and in the employment of faculty and civil service staff.

Freshman applicants for all programs at the University of Minnesota are required to take the tests of the American College Testing Program (ACT). After completion of the required prepharmacy work, the students apply directly to the College of Pharmacy for admission to the professional segment of the program. Admission is presently performed by committee action. Committee has student and female representation. Qualifications for admission based on Pharmacy College Admission Test Scores, grade point average, completion of minimum 2 years preprofessional program, application questionnaire, and 2 recommendations. Personal interview granted upon request. Non-residents (foreign and domestic) presenting above-average records will be considered individually. Non-traditional applications are also considered individually.

Mean grade point averages of those admitted the past three years has been 3.00 + .01. Preference is given to qualified residents (including area Wisconsin

residents receiving reciprocal tuition status) over all other applicants.

The College will consider admission to program leading to the Doctor of Pharmacy degree up to 40 students from surrounding states offer such 4 year programs.

Students wishing to enter the Doctor of Pharmacy Program gain admission on much the same criteria as used for admission to the under-graduate 5-year program. Whereas admission to the 5-year program is largely grade point average dependent, admission to the Pharm. D. program is determined by more of a composite view of attitude, interests, communicative abilities and GPA. A high GPA alone does not secure admission. The selection process is carried out by an admissions council composed of basic pharmaceutical sciences faculty, clinical faculty, and Pharm. D. students.

E. Student Recruitment

There are three major routes in which the College of Pharmacy functions in the recruitment of qualified, motivated students:

1. The Community Pharmacist -- The influence this individual has with respect to recruitment is extensive. In order to aid him, the College of Pharmacy supplies an 80 slide presentation with tape on "All Kinds of People" to be used as a recruitment aid, as well as printed informational material he can use in his presentation at junior and senior high schools in his community. He is also aided by the Alumni Association and the various state organizations.
2. The Faculty and Students of the College of Pharmacy -- Both faculty and students are encouraged to participate in various types of programs (drug abuse, 'college choice', 'professional choice', etc.) in which the nature of the profession of pharmacy, the opportunities available, the merits of various prepharmacy programs, and the merits of our own particular school may be discussed.
3. The College of Pharmacy -- Upon request from individuals who may be interested, the office of the College of Pharmacy routes questions to appropriate personnel, mails literature pertaining to the profession, and aids in the proper application and registration of the prospective student. In addition, both the offices of the Director of Continuing Pharmacy Education and the Assistant Dean for Student Affairs work in this area. All Community Colleges, State Colleges and Private Colleges have been contacted through their counselor offices by the Assistant Dean to create a liaison and establish a free flow of communications and information.

The need for quality recruitment is considered vital by the College in order to draw those individuals who will be outstanding representatives of the profession of pharmacy in the future.

Equally important is the recognition of the abilities and needs of minority, socio-economic disadvantaged, and handicapped individuals. Active recruitment on the health sciences level takes place through the Health Sciences Committee for Disadvantaged Students. This group plans and coordinates various programs directed toward the minority and disadvantaged population. Included here is the Career Opportunities in the Health Sciences program. This program provides an intensive orientation to a number (35 in 1974) of minority and disadvantaged high school

students from the Twin Cities area. Implementation is through a teaming up of the students with faculty, researchers, and other students during the summer months.

At the College level, minority recruitment has been an extension of the regular recruitment methods outlined previously. Minority students currently enrolled at the College are especially encouraged to take part in the recruitment activities.

Funding for minority and disadvantaged students takes place through the regular recruitment methods outlined previously. Minority students currently enrolled at the College are especially encouraged to take part in the recruitment activities.

Funding for minority and disadvantaged students takes place through the regular scholarship and loan funds. If they are financially eligible, they receive priority in the distribution of these monies. In addition, four S.W. Melendy Grant-in-Aids have been established in the preprofessional program (1st and 2nd) for assisting financially needy identifiable minority students.

While the attrition rate of pharmacy students in general over the three years of professional schooling is 5 to 8%, that for minority students has been negligible. The number of graduates attributed to our program for the past five years can be found on the preceding charts.

The upper midwest (including Minnesota) has a relatively high proportion of the American Indian population. To date, the minority recruitment program in this area for the College of Pharmacy has been less than successful as only one American Indian student is currently enrolled in the College. This continues to be one of the areas of high recruitment activity.

The College has had excellent success in the recruitment of female students as indicated by the preceding chart. Their recruitment will be continued to be encouraged.

The College is committed to an expanded minority and disadvantaged student recruitment program. This includes Blacks, American Indians, Chicanos, Asian-Americans, and others. Recruitment of the handicapped will also receive priority. To emphasize this commitment 10% of all available slots for undergraduate enrollment are kept open for minority, disadvantaged, and/or handicapped students until a given cut-off date at which time the openings which remain are filled by the other applicants.

To aid in the recruitment of minority group and disadvantaged students, a special program has been instituted at the health sciences level. The program director has his appointment with the College of Pharmacy in the Department of Clinical Pharmacy.

Out of the 14 positions on the College Board (the student governing body) 6 are currently held by women. Women and minority students also actively participate in the student organizations.

Minority faculty recruitment is a priority. Recent additions to the faculty include three women and one black (all with Clinical Pharmacy appointments).

The new facility should aid minority and disadvantaged student recruitment from an expanded student enrollment base and from expansion of the interdisciplinary concept. Another advantage lies in the fact that the new facilities have been designed so as to completely accommodate the handicapped student (the plans have been approved by the Minnesota Society for Crippled Children and Adults). Present facilities do not accommodate the handicapped.

BUDGET SUPPORTING STUDENTS IN COLLEGE OF PHARMACY FOR 1973-74

A. Federal Loans	\$115,500
B. Federal Scholarships	28,500

C. Privately Sponsored and University Scholarships	
D. University Institutional Loans	25,000
E. State Scholarships or Grants-in-Aid	
F. College Work Study Programs	
TOTAL	169,000

F. Health Sciences Minority Program Plan

The Health Science Units support a coordinated plan for recruitment and retention of minority students despite the strong probability that there will not be equal results for each unit involved. We have been able to develop an effective group to further refine and carry out the program which is presented on the following pages. Additional funding is being sought presently to implement some of the programs. If funding is not obtained the various programs will be carried out at a much reduced pace.

It is believed that we have gained enough experience in our efforts in minority recruitment to assure us that the "Program Plan" is the direction that we must move. For Pharmacy, it is hoped that we will be able to gain success that our considerable past efforts proved inadequate for our expectations. On the following pages the reader will find a copy of the "Program Plan".

PROGRAM PLANHEALTH SCIENCES MINORITY PROGRAMS

Goal: Exploration of means of providing educational opportunities in Health Sciences, for Minority Students.

Objective 1: Improvement and Expansion of Outreach Programming.

Program A. Counsellor Training. (1) Collection, collation of data related to group differences and integration into training program for counsellors.

(2) Using same data, together with workshop results, develop relevant counselling/advising materials.

Program B. Undergraduate Advisor Workshop: In conjunction with Student Affairs, develop workshops that would be aimed at somewhat alleviating problems related to advising of undergraduate minority students.

Program C. Community Activities Series: (1) Parent Information Workshops designed to inform parents of Health Science areas such that they might be able to provide others in family support as needed.

Program D. Career Awareness Activity.

1. Short term activities of no more than three day duration.

a. On-campus activity would be carried on in conjunction with the several Health Sciences areas.

b. Health Sciences Minority Programs Staff will travel to schools

around the State to present programs on Health careers.

c. Health Sciences Minority Programs staff, when appropriate will attend and participate in open meetings of Health Sciences Professional Societies.

2. Long-term activities of no more than two months.

In conjunction with various High School and other enrichment programs, provide intensive experiences for groups of students that would expose them to the range of health careers.

OBJECTIVE II. Expansion and Further Development of Educational Placement Activity.

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Program A. Data Collection. An attempt will be made to develop screening techniques that will permit us to identify prospective students accurately as well as to be able to identify areas of possible weakness and strength. (Office of Education)

Program B. High School Equivalency. Identification of interested and capable students and coordination of activities that would lend to their receiving the GED and ultimately matriculating either into a Health Science Training Program, or a Pre-Health Sciences Program.

Program C. Career Opportunities in Health Science. This summer program would see High School Students working in Health Science areas.

Program D. High School Health Sciences Program. Assuming we have been able to

identify students with both interest and capability in pursuing careers in Health Sciences, we would, in cooperation with the School System, work to develop both the skills and interests of these students.

Program E. Post-Baccalaureate Program. Following data provided through appropriate diagnostic tests, a program of preparation for professional schools will be undertaken with students, who, though possessing a college degree, are nonetheless academically deficient. This program will range from a minimum of three quarters to a maximum of two years, and two summers.

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OBJECTIVE III. Coordination of existing University Programs in ways that would be beneficial to Minority Students.

Program: Given that a large number of resources already exist both in the community and on the University Campus, attempts will be made to identify and label these so that both program and students may make adequate use of these resources and avoid unnecessary duplication.

OBJECTIVE IV. Development and integration of Programs within the existing University Structure.

Program A. Undergraduate Curriculum. Following the lead of CLA, and with their cooperation and assistance, we will present an undergraduate course sequence that will be primarily directed towards Minority Students in the first two years of College. Concurrently with this, we will develop Learning Materials to be used in conjunction with this sequence.

Program B. Programs for Partially Prepared Students. Recognizing that there is a class of adults who (a) is partially prepared, or (b) has been trained in certain Health Career areas, (e.g. Corpsmen) and who might wish to become better trained, fully trained or prepared for different training and who cannot afford either monetarily or in respect of available time, to do this fully, we shall prepare development programs that would begin to address these needs.

GOAL: Cause program activities to reflect more adequately a true meshing of the needs of educational communities with those of minority communities.

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OBJECTIVE 1. Identification of areas of community need and capability.

Program A. First to examine manpower availability and deployment in minority communities, then to identify programs that meet expressed need in communities.

Program B. Health Policy Explorations. We propose to hold a closed conference of nationally active minority professionals in the Health Sciences and service fields for the purpose of exploring areas of concern to minority communities.

2/28/75

IX. BUDGET AND FINANCIAL INFORMATION

There follows a statement of Expenditures and Source of Funds prepared by the office of the Vice President for Finance (a letter of explanation from this office is also attached).

Additional information could prove useful to the interested person. An estimate of support not included above includes:

- a. Estimated administrative, building and grounds, library, insurance, depreciation, and other pharmacy college costs paid by the University but not included in the pharmacy college budget \$343,325
 - b. Estimated value of services, commodities, or accommodations provided by basic science instruction 149,353
 - c. Estimated value of services, commodities, or accommodations provided by non-basic science instruction (liberal education costs not included) 40,083
- Total 532,761

The Health Sciences Center continues to place great emphasis upon the development of interdisciplinary programs which will result in multiple use of facilities and faculties.

Sponsored research from governmental sources is running considerably ahead of projections as shown on the following listing of grants awarded during the period July 1, 1974 to March 1, 1975. In a few cases the total amount was awarded for period of more than one year. We have under consideration grant applications in excess of three million dollars. Non-governmental research support is running slightly less than projected. In addition, one faculty member has a Career Development Award, and another is pending. Finally, we have support in terms of fellowships for about twenty students.

Mention should be made of the awareness of increased operating costs related to the operation of the proposed new facility. Of course absolute assurance that the State will accept this expense cannot be given. However, historically this has been the last difficult problem with the legislature. To this time there has been an acceptance that the commitment to a new facility included the operating costs. There is every reason to believe that this philosophy will continue.

Grants Awarded
July 1, 1974 to March 1, 1975

I. U.S. Public Health Service	
Pharmaceutical Sciences Training	80,430
Institutional Development-Capitation	332,406
	<hr/>
Total.....	422,836
General Research Support (Weaver)	9,502
Special Project Grant (Abdel-Monem)	50,968
	<hr/>
Total.....	60,470
Cancer Compound Synthesis (Vince)	63,034
Analgesic Receptors (Portoghese)	43,770
Glyoxalase (Vince)	25,000
Synthesis Ornithine Decarboxylase Inhibitors (Abdel-Monem)	20,593
Elucidation Polyamine Conjugatos (Abdel-Monem)	20,601
Tooth Minerals (Nelson)	46,467
Heart and Lung Project (Portoghese)	88,123
Sulphydryl Compounds (Nagasawa)	48,607
	<hr/>
Total.....	356,195
II. Drug Enforcement Agency and Other Federal Agencies	
Drug Control Evaluation (Wertheimer)	92,227
Hypertension Study (Kabat) RMP	22,000
Role Development for Pharmacists (Kabat) AHEC	20,000
	<hr/>
Total.....	134,227
III. State of Minnesota	
Drug Monitoring (Hammel)	11,370
Cambridge State Hospital (Kabat)	15,912
Skilled Nursing Homes (Kabat)	8,000
	<hr/>
Total.....	35,282
	<hr/>
	TOTAL....1,009,010



UNIVERSITY OF MINNESOTA

Office of the Vice President for
Finance, Planning and Operations
301 Morrill Hall
Minneapolis, Minnesota 55455
(612) 373-5940

March 10, 1975

Lyle A. French, M.D.
Vice President for Health Sciences
432 Morrill Hall
East Bank Campus

Dear Doctor French:

My office has prepared the financial information for the Health Sciences College of Pharmacy for the years 1971-72, 1972-73 and 1973-74 from the information contained in the University of Minnesota Financial Report and other internal records.

Our projected budget for 1974-75 approximates a 9% increase over 1973-74. Based on previous expenses, 1976-76 and 1976-77 are projected using a 10% rate. For 1977-78 through 1979-80, 8% increases in costs are projected. The increases of the first three years are generally larger than those of the latter two years which reflect our five-year estimates of costs.

In terms of the format of this Financial Report, tuition estimates are shown as part of the income, even though tuition is collected centrally and is not credited to college accounts. Indirect costs such as maintenance and operation of University buildings, central administration and library expenditures are not shown in the collegiate summaries but are funded centrally.

We will be happy to supply any further information that may be needed for the applications.

Sincerely yours,

James F. Brinkerhoff

JFB:vma

Enc.

UNIVERSITY OF MINNESOTA
COLLEGE OF PHARMACY
Statement of Expenditures and Source of Funds

SOURCE OF FUNDS	1972-73	1973-74	Projected 1974-75	Projected 1975-76	Projected 1976-77	Projected 1977-78	Projected 1978-79	Projected 1979-80
State Government	\$ 514,629	\$ 545,765	\$ 595,000	\$ 655,000	\$ 722,000	\$ 780,000	\$ 843,000	\$ 910,000
Student Tuition	197,473	302,671	330,000	363,000	399,000	431,000	465,000	502,000
Sponsored Research								
Government	210,521	239,114	261,000	287,000	316,000	341,000	368,000	398,000
Non-Government	36,999	27,480	30,000	33,000	36,000	39,000	42,000	45,000
Non-Research & Student Aid								
Government	269,666	303,043	330,000	363,000	399,000	431,000	465,000	502,000
Non-Government	43,738	51,970	57,000	63,000	69,000	75,000	82,000	88,000
Miscellaneous--Temporary Investment, Overhead, and Other	39,659	43,942	47,000	51,000	56,000	60,000	65,000	70,000
Total Funds	\$1,312,685	\$1,513,985	\$1,650,000	\$1,815,000	\$1,997,000	\$2,157,000	\$2,330,000	\$2,515,000
EXPENDITURES								
Instructional								
Salaries & Wages	\$ 596,932	\$ 715,896	\$ 780,000	\$ 858,000	\$ 944,000	\$1,020,000	\$1,102,000	\$1,190,000
Supplies, Fringe Benefits, Expenses, Materials, Services	153,540	172,585	188,000	207,000	228,000	246,000	266,000	287,000
Equipment	1,289	3,897	4,000	4,000	5,000	5,000	5,000	5,000
Sponsored Research								
Salaries & Wages	152,992	176,777	193,000	212,000	233,000	251,000	271,000	293,000
Supplies, Fringe Benefits, Expenses, Materials, Services	51,460	72,509	79,000	87,000	96,000	104,000	112,000	121,000
Equipment	43,068	17,308	19,000	21,000	23,000	25,000	27,000	29,000
Non-Research & Student Aid								
Salaries & Wages	156,576	141,253	154,000	169,000	185,000	200,000	217,000	234,000
Supplies, Fringe Benefits, Expenses, Materials, Services	145,431	195,480	213,000	235,000	259,000	280,000	302,000	326,000
Equipment	11,397	18,280	20,000	22,000	24,000	26,000	\$ 28,000	30,000
Total Expenditures	\$1,312,685	\$1,513,985	\$1,650,000	\$1,815,000	\$1,997,000	\$2,157,000	\$2,330,000	\$2,515,000

X. SALVAGE

The College of Pharmacy is considered to be one of the very best such schools in the country. This has resulted from the efforts of a pioneering innovative faculty, enthusiastic leadership and superior students. This quality program has been realized even though appropriate facilities have never been provided. Throughout its history since 1892, the College has been housed in renovated facilities built for very different kinds of programs. The present main facility, Appleby Hall, was formerly the School of Mines building. It was renovated in 1960 to serve the needs of the College of Pharmacy with a FTE faculty of about 10, a maximum undergraduate class size of no more than 80 and a moderate graduate group of 25 students.

The situation in 1975 represents a very significant increase over the maximum projections at the time that Appleby Hall was occupied. The situation today is 1) a FTE faculty in excess of 40; 2) an entering undergraduate class (B.S.) of 123; 3) a new Doctor of Pharmacy program with 25 students; and 4) a graduate student enrollment of 66 students. As a result Appleby Hall became inadequate several years ago. Nevertheless, in 1967, this faculty, after careful study of the future of health care delivery systems, expanded roles of pharmacists and the need for pharmacists in Minnesota and the upper midwest, chose to forego an almost certain addition to Appleby Hall in order to become a vital part of the developing Health Sciences Center. This requires a movement into the health center complex as well as the integrating of programs. Since then, every effort has been made to bring this complex into being. Programs have been implemented for the development of health teams through cooperative programs of education and service within the center and through out-reach programs. The planned expansion has had and continues to have the support of University Administration, the Board of Regents and State Government. We might even include the Federal Government since its representatives have been enthusiastic about the concept and since earlier federal grant applications have received approval and funding. The entire Master Plan of the Health Sciences and specifically, Units A, B/C and F was reviewed by the Bureau of Health Professions Education and Manpower Training of HEW in 1970. The required enrollment increases for federal participation were separated by disciplines. A 40% enrollment increase for the Pharmacy portion of Unit F accompanies this application.

The College has followed a plan of increased student enrollment toward the desired level at the time the facility would be occupied even though present facilities failed to meet our needs. As a result the following alternatives have been developed. With the availability of shared classrooms in Unit A, all but one classroom in Appleby Hall has been converted to laboratory use, both graduate and undergraduate as a result of classroom use in Unit A plus the availability of health science student lounges in the same building, the students now spend a great deal of time in Unit A with a decreasing contact with faculty, an unhealthy educational situation. Stock rooms in Appleby Hall have been consolidated and the ones freed up converted into research space or having resources center. The latter is very inadequate at a time when the faculty and students wish to make greater use of this approach to education. There is no solution to this

problem in space controlled by the college and no solution in Appleby Hall. The end of corridors in Appleby Hall have been blocked off to make additional faculty offices. Other solutions have been to acquire space in Elliott Hall for the large and important Drug Information and Education Program for the University system directed by the college. Two faculty have office laboratories in the Department of Pharmacology in the School of Medicine. Finally, we have renovated an old apartment house on the site for Unit F to house Pharmacy administration faculty, graduate programs, the Center for the Study of Pharmaceutical Systems (Pharma SYST), the Doctor of Pharmacy students, a number of the clinical faculty, the staff of the division of continuing pharmacy education and a portion of the College administration. Finally, several clinical faculty members maintain their principal office in the affiliated institution.

Without a new facility it will be difficult, if not impossible, to maintain the quality of education. Already, there is a loss of communications and the ease of working together by faculty members because of the dispersion. While morale is high, it is supported by the expectations that the present inadequacies and inconveniences are temporary in nature.

If no facility is forthcoming the College will find it necessary to decrease the enrollment from 123 toward the 80 which can be handled in the present facility if the quality of education is to be maintained at its present level. Quality of education has a very high priority with this college facility. In addition, the plans for the Doctor of Pharmacy program to assist in supplying needs for the upper-midwest would have to be scrapped and the enrollment maintained at its present level. Graduate programs would have to be decreased. Since much of the increase has come in Pharmacy administration, a shortage area, this would be counter to the needs of this country.

The accrediting body for pharmacy, the American Council for Pharmaceutical Education mentioned our need in its recommendations following an accreditation unit in 1972 (follows).

Action and Recommendations of the American
Council on Pharmaceutical Education*

The report of the examination of the University of Minnesota College of Pharmacy for continuation of accreditation by Council representatives A.G. (Mike) McLain and Melvin W. Green on October 11-13, 1972 and communication received from the institution relative thereto were duly considered at a meeting of the American Council on Pharmaceutical Education held in Chicago, Illinois on January 29-30, 1973.

Following a discussion of the elements of strength and weakness of this College and its program, it was the decision of the Council that this school complies with the standards of the Council and that it should be retained on the list of accredited colleges of pharmacy to be published July 1, 1973. It is expected that annual reports to the Council will continue to show progress in the various phases of the program of the College of Pharmacy.

In view of the apparent progress that is being made toward more interdisciplinary instruction at this College, it is the hope of the Council that ways will be found to make it possible for the College of Pharmacy to relocate on the health affairs campus in the not too distant future.

Fred T. Mahaffey, Secretary
American Council on Pharmaceutical Education

*Note: The signed original is available in the Office of the President, University of Minnesota.

Item 10 -- DESCRIPTION OF FACILITY

I. Current Space and its Utilization

SUMMARY OF SPACE CONTROLLED BY THE APPLICANT

	<u>Total</u>	<u>New Assignable Square Feet (NASF)</u>		<u>Number of Student Stations</u>	
		<u>Total Utilized</u>	<u>Usable by Program</u>	<u>Total</u>	<u>Usable by Program</u>
Classroom-type instructional space	2128	2128	0	150	0
Laboratory-type instructional space	6749	6749	0	176	0
Library space	2108	2108	0	60	0
Auditoriums	--	--	--	--	--
Administrative Offices and Areas	5258	5258	0	xxx	xxx
Faculty Offices	4686	4686	0	xxx	xxx
Research and Research Training Space*	9988	9988	0	xxx	xxx
Animal Facilities	821	821	0	xxx	xxx
Other Space	12,638	12,638	0	xxx	xxx
Total (Exclusive of Patient Care Facilities		44,376	44,376		

*Includes desk space for graduate students

UTILIZATION OF INSTRUCTIONAL CLASSROOMS AND LABORATORIES

Hours per year Spent by a Typical Full Time Student in Areas Controlled by the Applicant School

	<u>A</u> Total Columns B & C	<u>B</u> Classrooms*	<u>C</u> Instructional Laboratories
First year undergraduate	288	216	72
Second year undergraduate	684	432	252
Third year undergraduate	432	360	72
Fourth year undergraduate	108	108	0
Fifth year undergraduate	--	--	--
Sixth year undergraduate	--	--	--
Graduate Students enrolled for degree	<u>1100</u>	<u>360</u>	<u>750</u>
	2612	1476	1146

Academic Year

	1 and 2	3 and 4
Number of weeks in the Academic Year	36 weeks	48 weeks
Number of Hours in the Academic Week	40 hours	40 hours

* Including small group classrooms (e.g., conference areas)

Space currently controlled by the College of Pharmacy is totally inadequate for the purposes of optimally training B.S. pharmacists, Pharm. D., and graduate students. There is considerable overcrowding with an end result which has fragmented the College over several different (and removed) sites. This gross deficiency has been highlighted in earlier segments of this application.

For space not controlled by the applicant but available on a joint usage basis, the following figures are provided:

	<u>Number of Student Stations</u>	<u>Number of Rooms</u>	<u>Number of Room Hrs. per Academic Year</u>
Classroom-type instructional space	1456	12	970
Laboratory-type instructional space	225	3	200

A majority of this joint-use space is found in Unit A of the Health Sciences Center. Thus, in actuality while many student functions have already left Appleby Hall, faculty and support functions remain behind.

II. Alternatives Considered.

Several years ago it was decided that in order to optimize health care training, especially in the interdisciplinary aspects, the College of Pharmacy would have to be an integral part of the Health Sciences Center. Thus, any alternatives dealing with renovation and/or expansion of existing facilities have had to be ruled out.

Alternatives looked at in relation to space within the existing Health Sciences Center have also been ruled out. The master plan for the Health Sciences at the University of Minnesota (see Part IV of this section) has specified how space for pharmacy and accordingly the available space within the Center (e.g., the space freed up when the School of Dentistry moved in Unit A) has been assigned other functions. Similarly, space in Unit B-C (under construction) has already been appropriated to other segments of the health Sciences.

III. The Proposed Project

A. Space Requirement Logic

Generally space requirements were established by a program analysis of individual work stations. The square footage resulting follows a graphical process of assembling the individual work stations into a larger operating unit i.e., a lab, office or classroom.

Student laboratories for all disciplines have a number of common characteristics. Sections are limited to 48 or 75 students. Student work stations are 4' - 0' per student. Generally the labs are glanked by ancillary instrumentation and small discussion rooms as well as stock and preparation rooms.

Graduate and Faculty laboratories also have a number of common characteristics. A graduate student is provided with a 12' - 0" bench and a 4' - 0" study carrel unit. A faculty member is provided with twice as much space and work area. Graduate and Faculty Laboratories are generally juxtaposed and share instrumentation whenever possible.

Other miscellaneous room area requirements respond to University of Minnesota area standards. These include office sizes by academic ranking, auditoria and classroom square footage per student.

The bulk of Pharmacy's classroom activities will take place within Unit F, although, as needed, we will be able to draw from the shared classrooms in the remainder of the Health Sciences Complex.

The following tables are taken from the "Evaluation of Report of Task Force on Teaching Space for Health Sciences Design Coordinating Committee" of November 13, 1968 and revised on June 4, 1969.

Distribution of Class Hours in 1976

	Class Hours Scheduled	
	<u>PROFESSIONAL</u>	<u>GRADUATE</u>
Classes for medical students	32	73
Classes for dental students	47	
Classes for pharmacy students	39	4
Classes for nursing students	67	37
Classes for OT-PT students	76	12
Classes for public health students	180	
Classes for med. tech. students	17	14
Classes for dental hygiene students	5	
Classes for medical science service	3	
Shared nurses/dental hygiene	4	
	<hr/> 470	<hr/> 140 = 610

Distribution of Class Hours by Hour and Size of Room

	I	II	III	IV	V	VI	VII	VIII	Totals
350	8	8	5	8	5	1			35
250	9	8	8	5	1	7	3	1	42
200	7	4	8	7		6	2	1	35
150	15	14	11	4	4	11	3	6	68
100	4	4		5	2	8	4	6	33
75	3	3	3			2	2	1	14
50	17	17	22	16	10	21	14	7	123
30	6	16	25	15	7	17	14	6	108
15	15	11	32	5	10	34	29	16	152
	86	85	114	65	39	106	71	44	610

The simulated model took into account only those classes actually scheduled. Thus, small interaction groups, seminars, laboratory sections, clinical group meetings, etc., all a part of the total pharmacy program, are not shown. These groups will be adequately housed in pharmacy departmental discussion/conference rooms. The class room hours attributed to pharmacy were taken from the Spring 1968 class schedule. Pharmacy's representative on this task force was Dr. Frank DiGangi.

As can be seen from the tables, pharmacy's needs were taken into account in the total planning for the Health Sciences expansion of classroom space. These needs for the most part can be adequately handled through the classrooms in Unit F. These include access to:

- Seminar rooms
- 75-seat classrooms (convertible to smaller ones, 35-40)
- 150 seat auditoria
- Several departmental discussion/conference type rooms.

Classroom needs beyond those provided in Unit F have been programmed in Units A and B/C under applicants space. In accordance with University policy, all classroom space is allocated through a central allocation office.

Experience to date with the classrooms/auditoria in Unit A has shown that existing space is already close to maximum in utilization (this is especially true for the classrooms at the lower ranges).

Breakdown of classrooms available in Unit A and B/C

<u>Unit A</u>		<u>Unit B</u>	
Seminar	11	Seminar	11
15 seat	3	Small classroom	8
20 seat	3	325 seat	1
50 seat	3		
100 seat	1		
200 seat	1		
250 seat	2		
350 seat	1		

Existing Health Sciences classrooms to be renovated

15 seat	3
30 seat	5
50 seat	2
75 seat	1
100 seat	2
150 seat	2
200 seat	1

numerous seminar and conference areas

With the exception of a few seminar rooms and the classrooms to be renovated, virtually all of the shared classrooms within the projected Health Sciences Complex are on the level of main student entry and activity (level 2 - one level below grade). This provides maximum efficiency with regard to the movement of the bulk of the student traffic as well as permitting flexibility and ease of class scheduling. This flexibility also extends to future developments within the areas of curriculum and educational methodology as a wide range of classroom sizes is available. This precludes the necessity of putting small class groups in large rooms which does not provide a desirable learning environment.

Allocation of space within the University is administered by the Office of Space Allocation. This office operates under a set of policy guidelines established with the counsel and advice of a faculty advisory committee. Actual allocations are based upon the guidelines which are modified by statements of programmatic needs submitted by faculty and administrators at the Departmental and Collegiate levels. Examples of the guidelines are:

Dean's Office	300 sq. feet
Assistant Dean	300 sq. feet
Assistant to the Dean	100 to 130 sq. feet
Department Head	195 sq. feet
Department Assistant Head	195 sq. feet
Departmental Multi-purpose	200 sq. feet and up (400 max.)
Faculty Office	130 sq. feet
Double Faculty Office	195 sq. feet
First secretarial position	195 sq. ft. (1 person + files)
General office	65 sq. ft. for each additional person
Classroom	15 sq. ft. per student station
Study Room	25 sq. ft. (up to) per student station
Laboratory	According to number of people, function, and equipment

B. Design Flexibility

The complex of new and remodeled existing buildings comprising of Health Sciences Facilities is the Architect's response to the University's goal of physical and curricular integration of the Health Sciences units with each other and the rest of the Minneapolis campus of the University.

The problem as defined by this goal was to develop a high density building system on a tight urban site with strong relationships to major existing facilities. This system needed to respond to the initial phase of expansion as well as to the continuing need for growth and change inherent in health sciences units.

The Architects' initial effort was to develop a master plan which provided for short and long term expansion and responded to the integrated relationships called for in the program. This master plan serves as a framework for growth by establishing the major paths of circulation knitting together new and existing buildings.

The units designated by the master plan to be housed in new construction were analyzed for common systems criteria. These criteria generated one building system which, with appropriate variations, could respond to the requirements of teaching and research labs, dental clinics, hospital outpatient clinics, offices, classrooms, and auditoria. And, in addition, could provide a high degree of flexibility and expandability.

The building system employs a module of 12'-4" x 12'-4" throughout the site area. Service towers 12'-4" x 12'-4" (nominal) are spaced 49'-4" apart in two directions creating a tartan grid which is broken in one direction by a pair of columns placed midway between the towers. A one way structural system integral with the service shafts has steel girders spanning the 24'-8" direction and steel trusses spanning the 49'-4" direction (see Building Systems Framework Isometric and Dimensional Characteristics Diagram). Building services are distributed vertically through the service shafts and horizontally through the depth of the floor construction. The frequency of the service towers allowed a minimum of 4'-4" floor depth which is divided into separate strata for power and communication, mechanical, plumbing, and lighting. In general, for the entire complex, partitioning stops at a totally accessible continuous ceiling plan 9'-0" above the floor permitting the services above to be distributed without interference. Typical floor to floor height is 13'-4".

All subsystems were developed and designed to accommodate the criteria generated by the program functions. A detailed description follows of several sub-systems which will establish the degree of thought that has gone into the development and coordination of the various sub-systems resulting in the overall building flexibility.

SUPER-STRUCTURE:

Typical floor slab construction is a composite cellular steel deck with a lightweight concrete topping. The selection of this floor construction is based on the economies inherent in the lightness of the floor itself as well as the supporting steel framing and foundations. The system provides electrical raceways within the floor construction both for present and future needs and

provides the required 2-hour fire rating without the need for additional fire-proofing on the underside of the deck.

Open-web trusses are provided as floor supporting members to provide maximum flexibility for lateral distribution of the mechanical and electrical systems between the floor slab and ceiling below.

CEILING SYSTEM DESCRIPTION:

The ceiling system will facilitate a degree of planning flexibility equal to that afforded by the structural and mechanical system. The ceiling is conceived as a continuous suspended plane extending from exterior wall to exterior wall under which partitions can be located and relocated as necessary. Above the ceiling ducted mechanical services can be arranged and rearranged as required without interference from walls or other vertical barriers.

To accomplish this the ceiling has to embody the following characteristics:

1. The suspension system must be capable of supporting the head of all partitions and door frames and provide adequate lateral stability without additional bracing. Walls must be attached and detached without damage to the ceiling. Although most walls occur in modular locations, attachment at random locations must be possible.
2. The suspension system must provide a framework in which light fixtures, air supply and return elements, sprinklers, smoke detectors, speakers, laboratory service columns and infill panels can be located and rearranged in various combinations.
3. The ceiling must offer architectural characteristics suitable for small intermediate and large areas.
4. The ceiling must be accessible to allow routine maintenance and rearrangement of mechanical equipment at any location above the ceiling.

The proposed ceiling system is composed of continuous service strips and of infill. The service strips are oriented in an east-west direction and are located 6'-2" o.c. at the quarter points of the 12'-4" architectural grid. The infill closes the space between the all purpose strips and provides for access to the plenum and accoustical separation of rooms.

The service strip furnishes the location for all mechanical service penetrations in the ceiling system. It is made up of alternating 4'-0" fluorescent light fixture locations and 2'-2" service panel locations. The modular locations of a 4'-0" fluorescent fixture is centered on the quarter points of the architectural grid but such a fixture must be relocatable at any point in the strip to accommodate non-modular rooms.

The service panel provides locations for sprinklers, smoke detectors, speakers, laboratory service columns and down lights.

Linear supply air handling elements are located as required, perpendicular to the service strip astride the cross runners with point returns located as required at the service panels.

In order to insure that partitions can be freely moved without unnecessary difficulty or damage to the ceiling system mechanical services passing between partition and plenum above are minimized. Plumbing fixtures located in areas not subject to change, are loop-vented underfloor. We recommend low-voltage

switch legs be used in these areas. In areas subject to extensive future change, piped services to laboratory benches shall be fed down from the plenum space in umbilical chases.

Detailed study of code requirements regarding fire rated walls indicates that each level be divided by only one partition which must interrupt the suspended ceiling plane. In each case the penetrating wall has been chosen as being the one least likely to be relocated.

PARTITIONING SYSTEM:

The partitioning system achieves the degree of economy and flexibility at the planning level provided by the basic mechanical and structural systems.

The total project was studied to find the basic sets of functions to be served by partitioning systems. Seen in conjunction with the ceiling system, the basic approach to the partitioning system is that it should be floor to ceiling light-weight space division. The partitions should be removable without damaging the floor or ceiling and without interrupting the activities in adjoining spaces. In this approach, doors and glass are treated as panels in the partitioning system must be locatable according to the module developed by the ceiling system - and the mechanical services provided by it, but it also must be able to adjust to non-modular conditions when functional requirements necessitate it. Pre-fabricated cold rooms, freezers and the like will be used and the partitioning system must accept them. There will be several spaces which require R-F shielding and partitioning systems must be able to provide this.

Several alternatives for each required basic type were proposed and studied. The cost of each proposal was compared to the requirements for adequate sound isolation, flexibility, durability and the particular requirements of each type. Resulting from this study a selection was made.

1. Gypsum plaster on gypsum lath screw attached to channel studs is proposed as the basic system on Floors 1 through 4. These floors contain most intensive teaching functions by large numbers of undergraduates, and therefore are subject to rather infrequent change.
2. Drywall on channel studs is proposed as the basic system for the laboratory and office functions located on Floors 5 through 9. These functions will require constant rearrangement of plan and will be used by a limited number of staff and graduate personnel.
3. Fireproof gypsum paneling is proposed to achieve the required fire rating around the floor to floor penetrations at stairs, mechanical cores, and elevator shafts.
4. Masonry is proposed for two applications:
 - a. Masonry with acoustic treatment will be used for the auditoria.
 - b. Both finished and unfinished masonry is proposed on mechanical floors and the animal room complex on Floor B, Bl, 1.

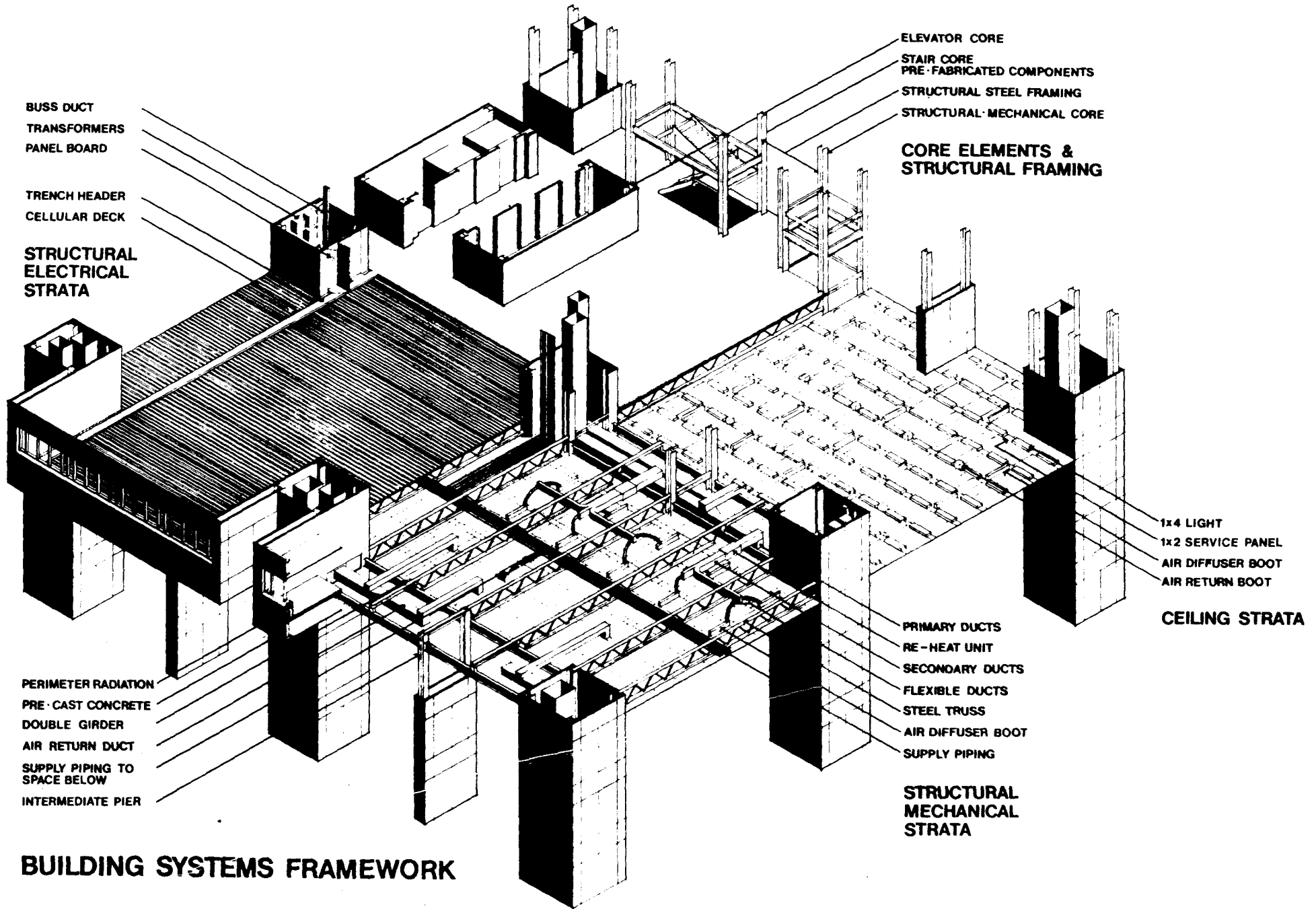
In areas of high humidity and/or where a high degree of cleanliness is required, a glazed coating is proposed (such as the animal room complex). This application may be used on plaster, dry wall and masonry.

CASEWORK:

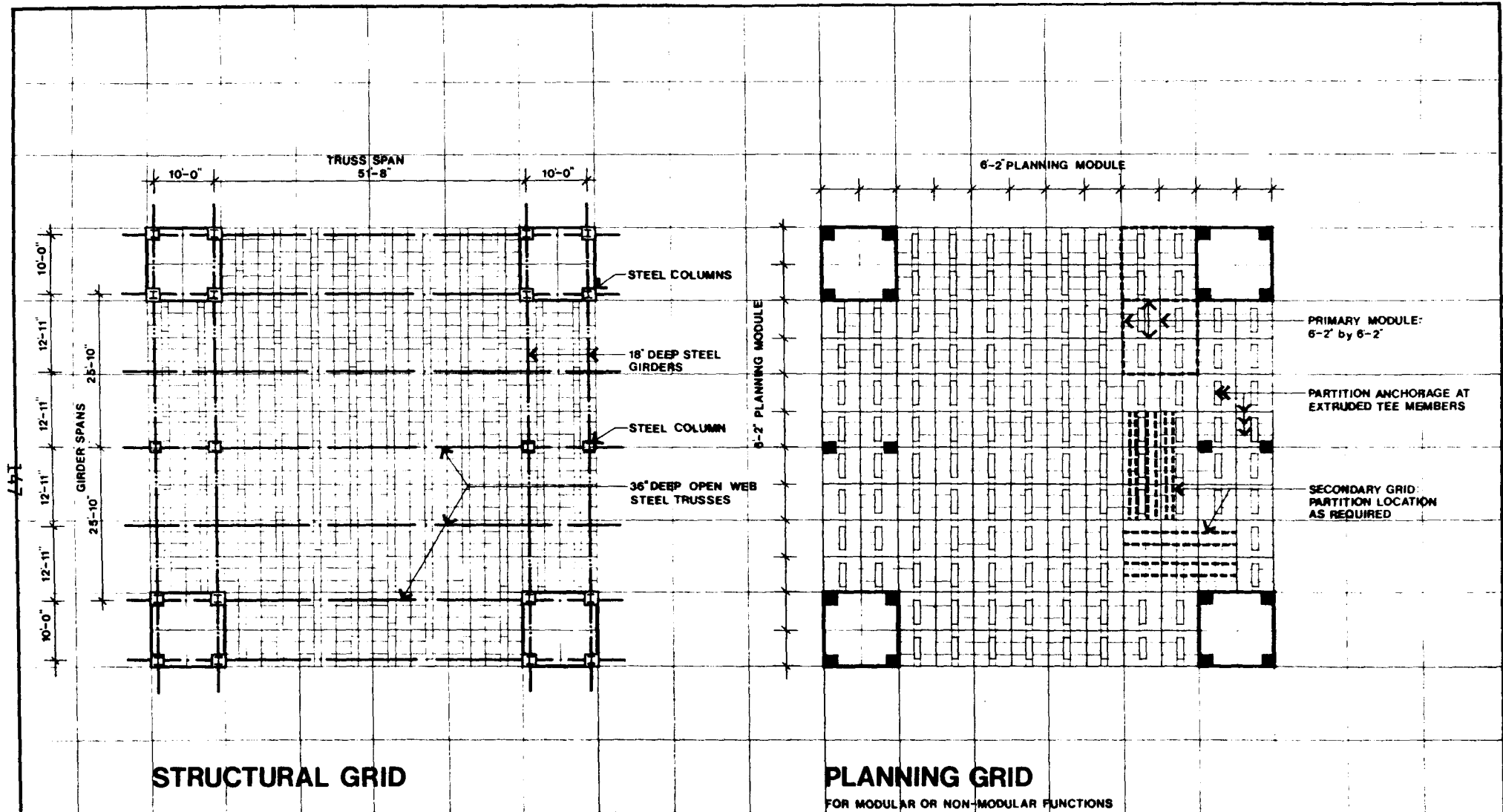
The flexibility afforded by the structural/mechanical system, interior partitions and ceilings will be matched by the system of casework. Elements will be dimensionally coordinated and capable of simple rearrangement to suit changing needs. The system used is the suspended or cantilevered type.

Dimensionally there has been a concerted effort to standardize the casework components. Typically units are either 2'-0" or 4'-0" wide. Unit types are readily interchangeable without expensive modifications associated with floor mounted casework.

Work stations have been standardized by dimension as well as by services provided therefore are not bound to one discipline.



BUILDING SYSTEMS FRAMEWORK

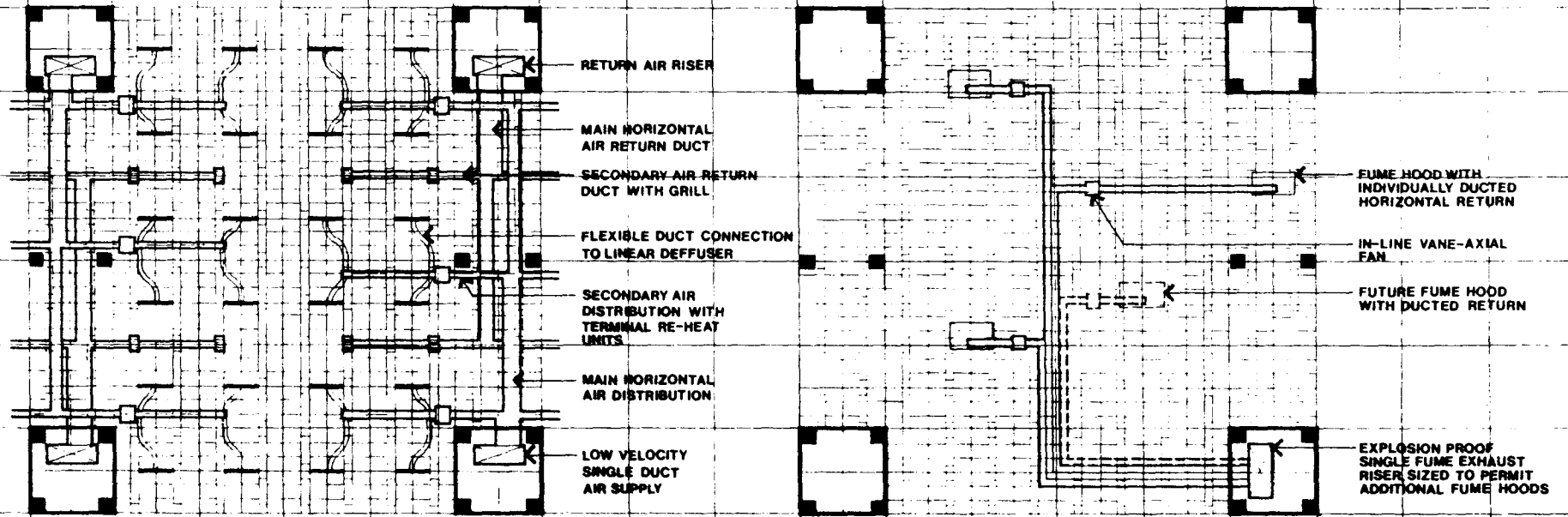


STRUCTURAL GRID

PLANNING GRID
FOR MODULAR OR NON-MODULAR FUNCTIONS

DIMENSIONAL CHARACTERISTICS

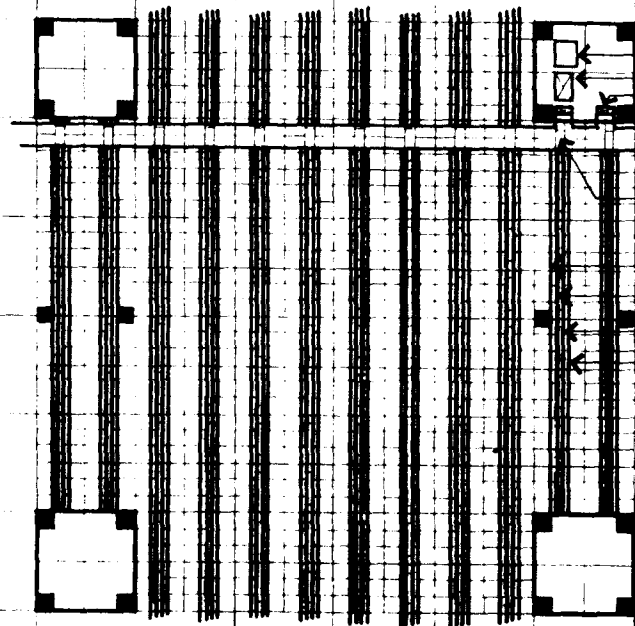
147



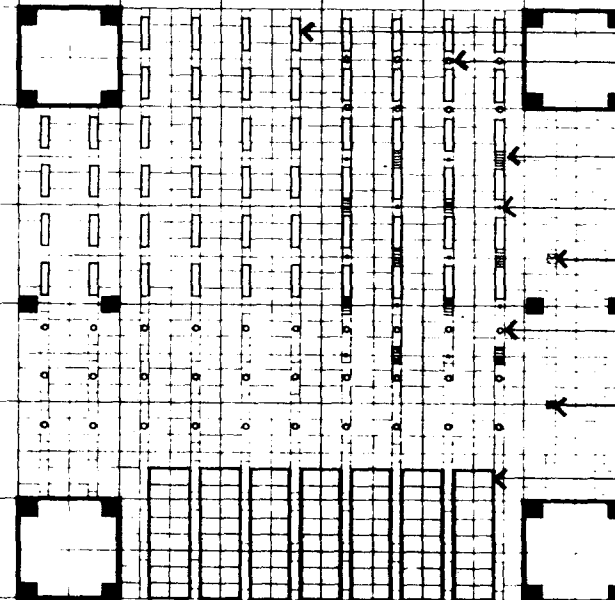
AIR DISTRIBUTION

FUME HOOD EXHAUST

H-V-AC

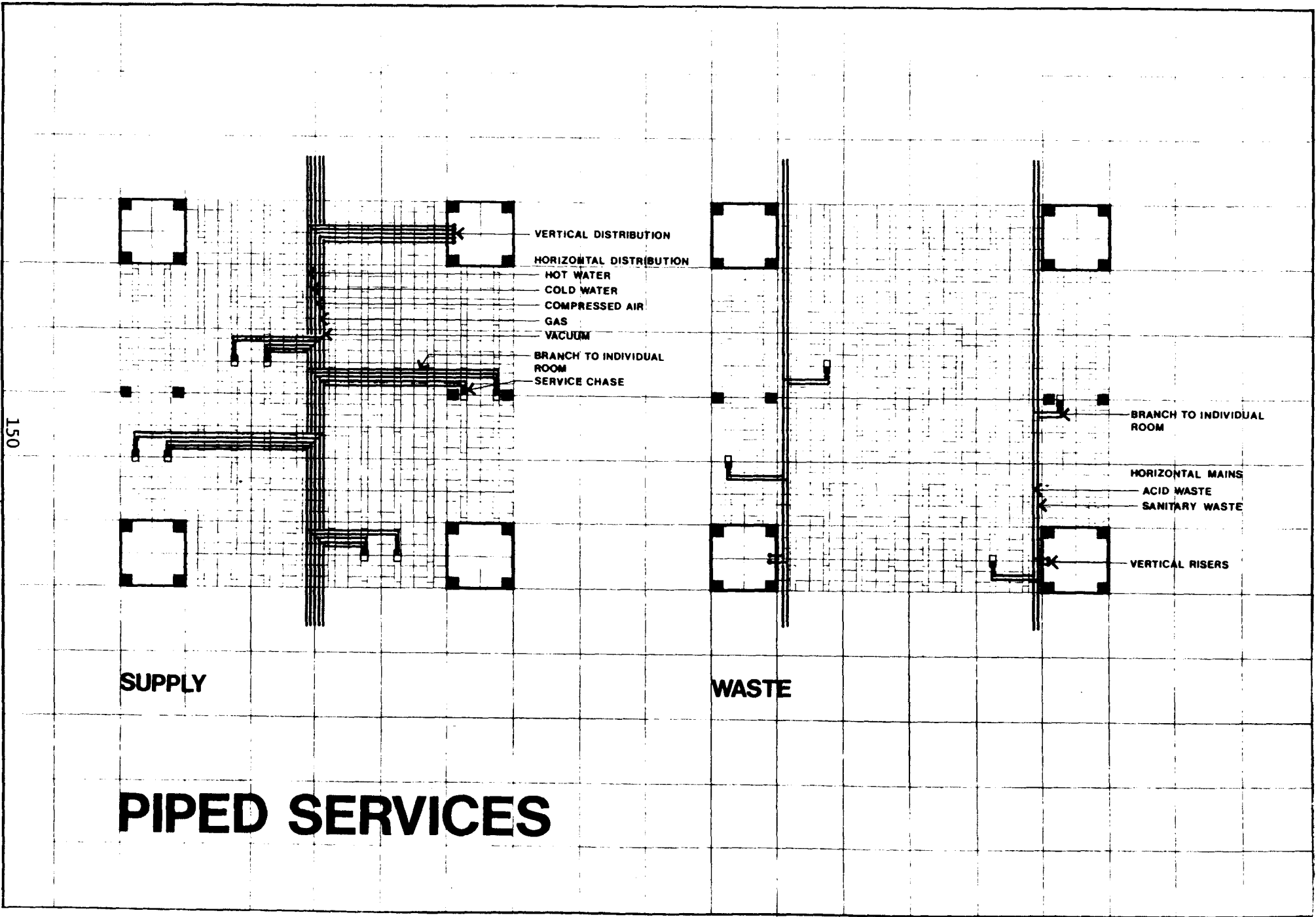


DISTRIBUTION OF SERVICES



LIGHTING PATTERNS-REFLECTED CEILING

ELECTRICAL SERVICES



150

- VERTICAL DISTRIBUTION
- HORIZONTAL DISTRIBUTION
- HOT WATER
- COLD WATER
- COMPRESSED AIR
- GAS
- VACUUM
- BRANCH TO INDIVIDUAL ROOM
- SERVICE CHASE

- BRANCH TO INDIVIDUAL ROOM
- HORIZONTAL MAINS
- ACID WASTE
- SANITARY WASTE
- VERTICAL RISERS

SUPPLY

WASTE

PIPED SERVICES

C. Detailed Description of Unit F

Unit F will consist of eleven floors of space located directly north of adjoining Unit A. Three levels are below grade. Schematically for the College of Pharmacy, Floors 1-3 relate primarily to undergraduate teaching, Floors 4-5 are administrative as well as faculty/graduate space, and Floors 6-8 are designed primarily for faculty and graduate research space functions. A detailed floor by floor description of function follows.

Basement

This level will be the primary location for major mechanical components serving the new construction. Mechanical space on this floor will be an expansion of the facilities provided in Unit A. Steam from the University central plant will be piped via the tunnel to Unit A on this level. Switch gear, pumps, chillers, emergency generating equipment will be located on this floor as well as on Floor 8. Major utilities will be distributed in vertical utility shafts 12'-4" x 12'-4" in dimension located typically 49'-4" apart.

Floor 1

The Central Service Corridor for the Health Sciences on this level connects with a service corridor in Unit F and will provide access to the new receiving center, Unit E. Major program elements accommodated on this floor are: Shared Facilities; Central Supply with its support rooms of Receiving, Instrument Repair, Mechanical Workshop, and Glass Washing. Student Locker Facilities, along with general storage for the College of Pharmacy and the School of Nursing will also be provided on this level. Elevating for Unit F consists of three cars grouped in one bank with two of the cars primarily for public traffic, with the other car having two openings to serve as both a passenger-freight elevator. A separate receiving room adjoining or in close proximity with the passenger-freight elevator occurs on all floors.

Floor 2

Floor 2 of Unit F, one floor below street level, will be a main entry point for students attending lectures in the Auditoria and classrooms. Two 150 seat auditoriums with projection booths and support facilities in addition to two classrooms for 75 students which can be divided into smaller subunits are on this floor. The College of Pharmacy's Biological processes undergraduate lab is also on this floor along with support space. This laboratory accommodates up to 48 students per section.

Floor 3, Ground Level

Unit F at ground level will be occupied by the chemical processes undergraduate lab and the accompanying instrumentation lab. The pharmaceutical processes lab is also located on this floor. The Drug Reference area is located so that it might be used in conjunction with the undergraduate laboratories and have easy access for use by the rest of the College. Formal entry for the building is on this level with a stair connecting floor 2 and floor 4, permitting undergraduate students to work either up or down one level to attend their laboratories without taxing the elevator system.

Floor 4

School of Nursing.

Floor 5

Floor 5 of Unit F will provide a major horizontal connection between Millard Hall, Unit A, Unit B/C, and the Mayo Building. Functions which will be located on this floor include College Administration and the Department of Pharmacy Administration. In addition, shared space for Educational Development with its associated production, dark room, audio-visual, auto-tutorial space, and computer space will occupy this floor.

Floor 6

Graduate teaching and faculty laboratories along with the shared spaces of Chemical and Equipment storage, Central Instrument room, and Radiation Synthesis and Counting will be housed on this floor. Graduate labs have been planned on an open, modular basis so that they may be subdivided in the future if it is so desired. Faculty offices and laboratory space has been organized in conjunction with the graduate labs so as to achieve an appropriate distribution between the number of faculty members and graduate students. Special rooms, such as hydrogenation lab, chromatography lab, bio-process lab and a cold room are also accommodated on this floor. Student study space is also found on this floor.

Floor 7

The majority of Floor 7 will house graduate laboratories, faculty offices, and laboratories, for graduate teaching and faculty research. Shared animal quarters are located on this floor directly behind the elevator bank so that a connection for service, cage washing, and use by other departments is easily accessible. A student study space is also provided on this floor space for basic research (wet-bench) for the School of Nursing.

Floor 8

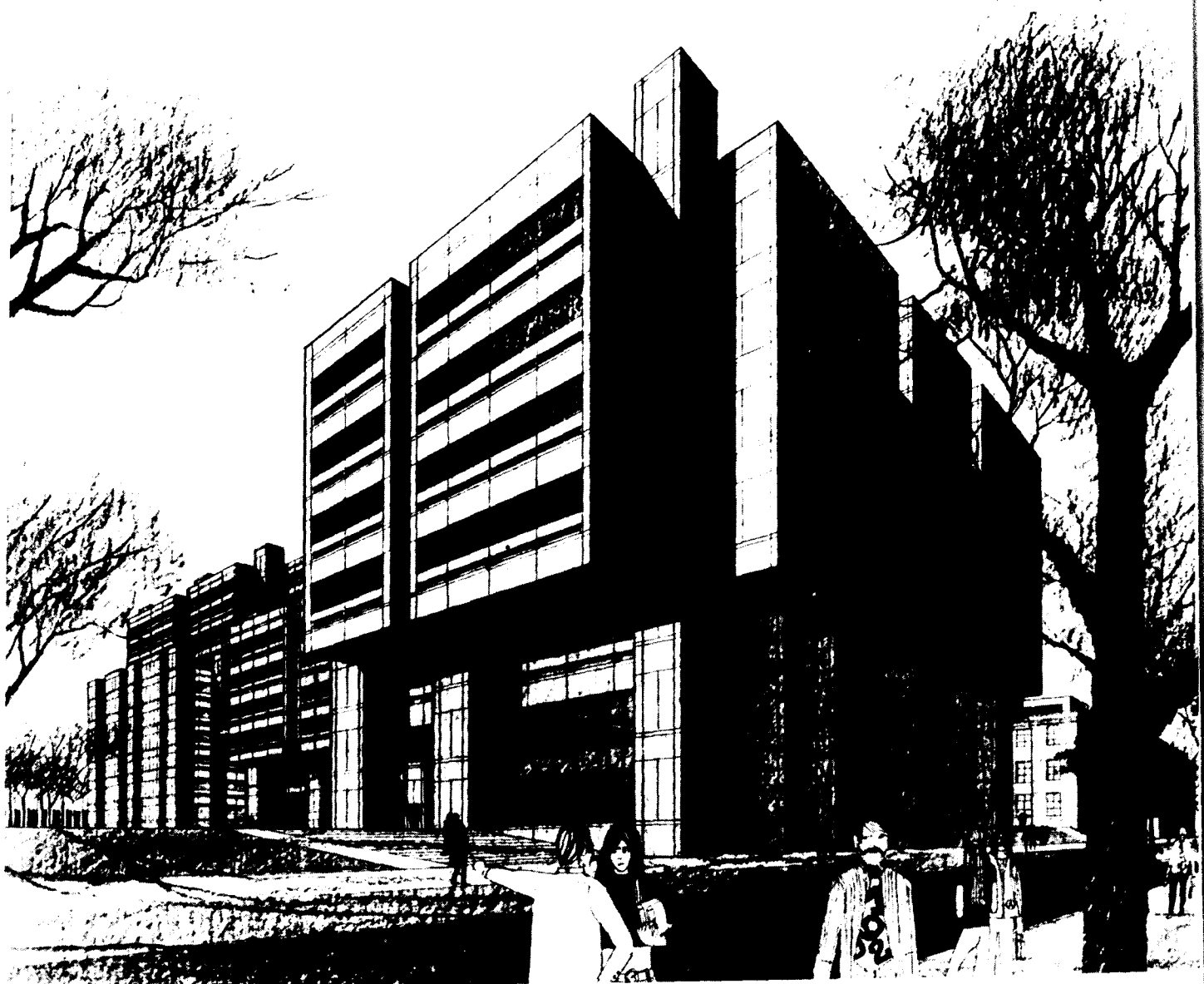
This floor houses faculty and graduate space for the clinical staff and Pharm. D. students within the College of Pharmacy. The remainder of the floor is for the School of Nursing.

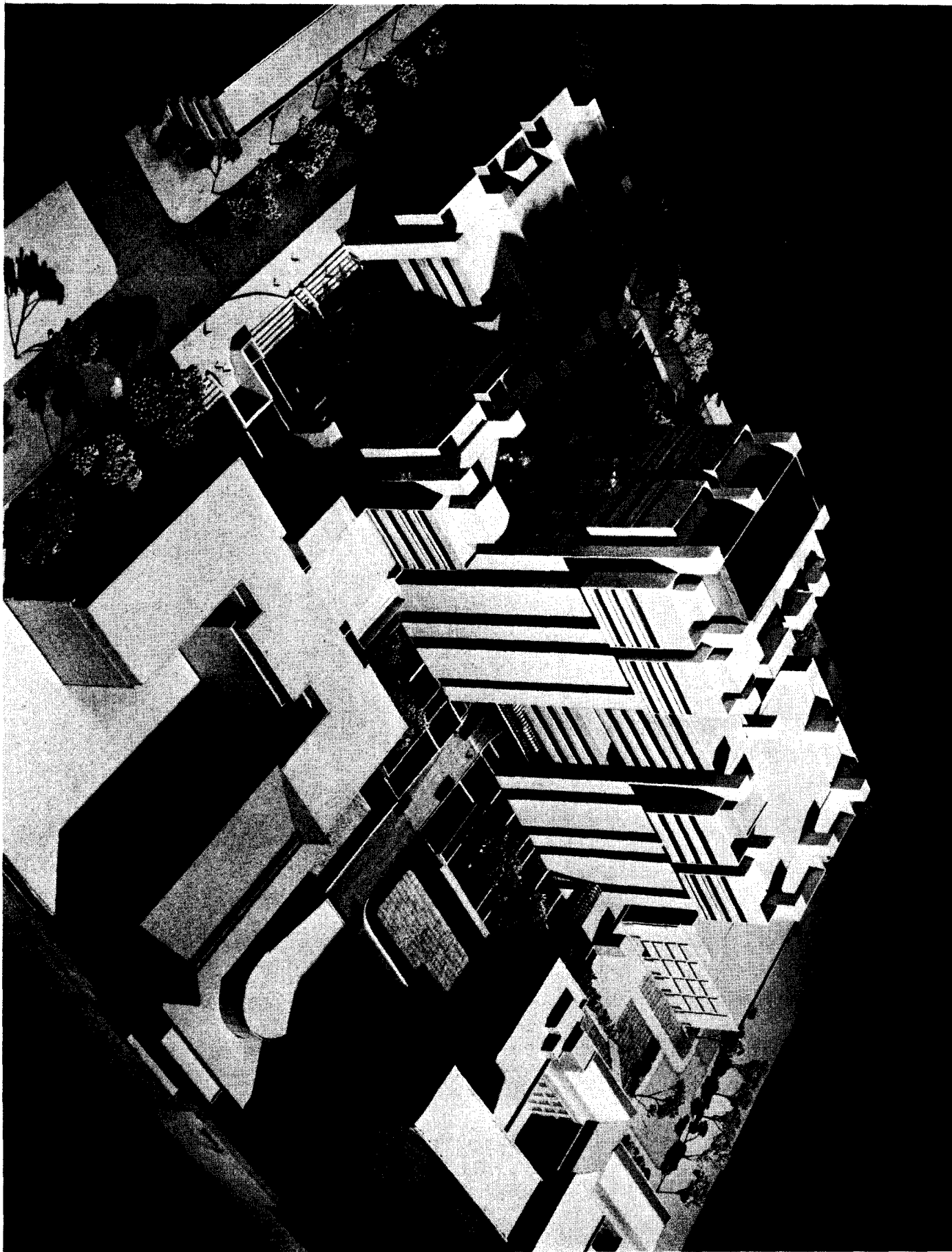
Floor 9

School of Nursing.

Floor 10

Greenhouse facilities for the College of Pharmacy are located on this level so as to permit the best possible exposure to natural light. The remainder of the space on Floor 10 will be occupied by Mechanical Equipment.





D. Space Summary

SPACE SUMMARY BY FLOOR

BUILDING UNIT F	ASSOC SQ FT BY FLOOR	ASSIGNED SQ FT BY FLOOR	NSF BY FLOOR	UNASS SQ FT BY FLOOR	SFG BY FLOOR
Basement			0	14,521	14,521
Floor 1	2,964	11,425	14,389	7,709	22,098
Floor 2	9,341	9,643	18,984	2,698	21,682
Floor 3	2,244	9,944	12,188	3,641	15,829
Floor 4	1,365	10,652	12,017	4,311	16,328
Floor 5	3,708	11,373	15,081	3,650	18,731
Floor 6	3,513	15,211	18,724	4,166	22,890
Floor 7	3,507	14,438	17,945	4,945	22,890
Floor 8	3,665	14,773	18,438	4,452	22,890
Floor 9	5,565	13,146	18,711	4,179	22,890
Floor 10	5,776	979	6,755	5,535	12,290
TOTAL	41,648	111,584	153,232	59,807	213,039

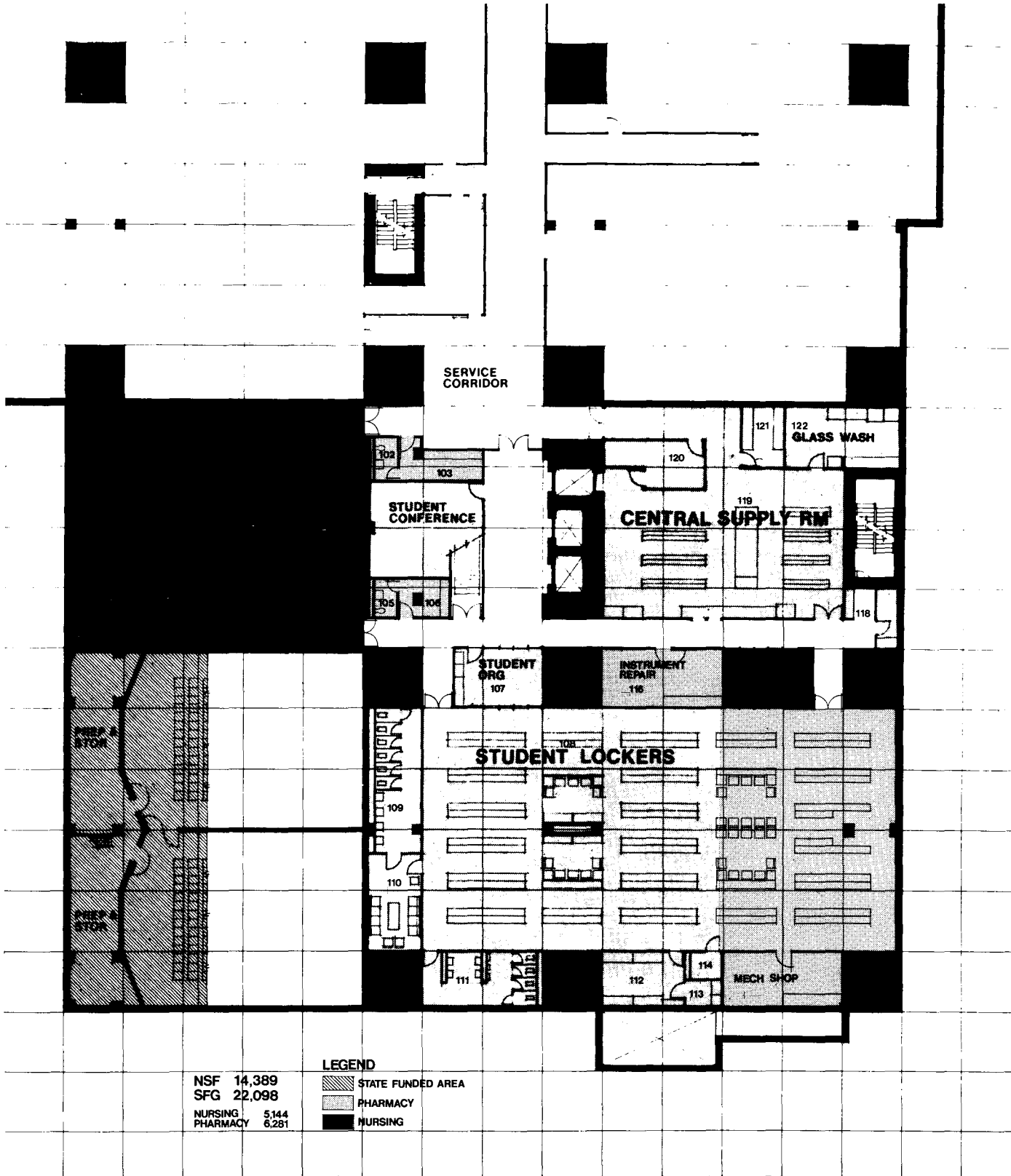
Breakdown of space by Function:

	<u>Pharmacy</u>	<u>Nursing</u>	<u>H.S. Shared</u>
Floor 1	0	2,991	8,434
Floor 2	4,153	0	5,490
Floor 3	9,057	0	887
Floor 4	0	10,652	0
Floor 5	10,611	0	762
Floor 6	15,211	0	0
Floor 7	11,690	578	2,170
Floor 8	4,683	10,090	0
Floor 9	0	13,146	0
Floor 10	<u>979</u>	<u>0</u>	<u>0</u>
TOTALS	56,384	37,457	17,743

Floor 1 Unit F

ROOM NUMBER	ROOM ASSIGNMENT	ROOM NAME	SFN PER ROOM	TOTAL ASSOC	TOTAL UNASS	TOTAL SFN	TOTAL SFG
F1-99		Corridor		1506			
101	N	Nursing Educ. & Research Dev.	2991				
102		Toilet		40			
103		Locker		102			
104	HSS	Student Conf.	583				
105		Toilet		40			
106		Locker		80			
107	HSS	Student Org.	226				
108	HSS	Student Lock	4818				
109		W-Toilet		289			
110		W-Lounge		220			
111		M-Toilet		268			
112		Storage		191			
113		Janitor		38			
114		Toilet (Handicapped)		51			
115	HSS	Mech. Shop	275				
116	HSS	Inst. Repair	304				
117	HSS	Student Org.	226				
118		Janitor		139			
119	HSS	Cent. Supply	1464				
120	HSS	Trash Rm.	180				
121	HSS	Solvent Stor.	90				
122	HSS	Glass Wash	268				
		TOTAL	11,425	2,964	7,709	14,389	22,098

P - College of Pharmacy
 N - School of Nursing
 HSS - Health Sciences Shared Space (Applicant space)



NSF 14,389
 SFG 22,098
 NURSING 5,144
 PHARMACY 6,281

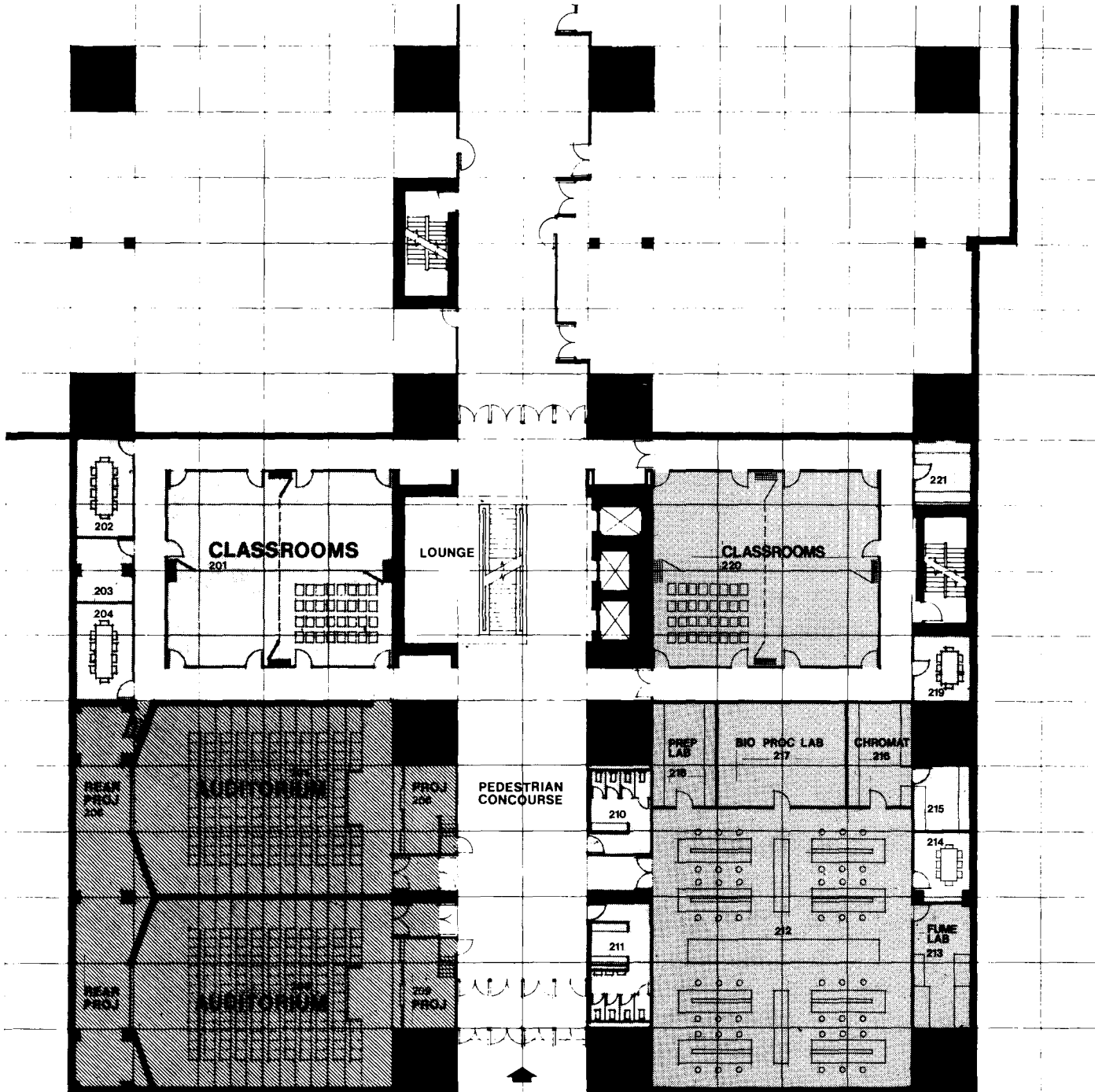
LEGEND
 STATE FUNDED AREA
 PHARMACY
 NURSING

TAC	COLLEGE OF PHARMACY & SCHOOL OF NURSING	PROGRAM UNITS:	FLOOR
	UNIVERSITY OF MINNESOTA	SHARED FACILITIES	1
HEALTH SCIENCES EXPANSION			

Floor 2 Unit F

ROOM NUMBER	ROOM ASSIGNMENT	ROOM NAME	SFN PER ROOM	TOTAL ASSOC	TOTAL UNASS	TOTAL SFN	TOTAL SFG	STATE FUNDED
F2-99		Corridors		4945				
201		Classroom		1596				
202		Conf.		208				
203		Storage		140				
204		Conf.		208				
205	HSS	Auditorium						2100
206	HSS	Rear Proj. Room						365
206A	HSS	Rear Proj. Room						365
207	HSS	Auditorium						2100
208	HSS	Proj.						210
209	HSS	Proj.						210
210		W-Toilet		210				
211		Men's Toilet		271				
212	P	Under G. Lab	2619					
213	P	Fume Lab	267					
214	HSS	Conf.	140					
215	P	Inst. Repair	140					
216	P	Chromat	247					
217	P	Bio Proc Lab	493					
218	P	Prep Lab	247					
219		Conf.		140				
220		Classroom		1596				
221	P	Inst. Lab	140					
		TOTAL	4,293	9,341	2,698	18,984	21,682	5,350

P - College of Pharmacy
 N - School of Nursing
 HSS - Health Sciences Shared Space (Applicant space)



NSF		SFG	
NSF	18,984	SFG	21,682
PHARMACY	4,293	PHARMACY	5,350
STATE	5,350	STATE	

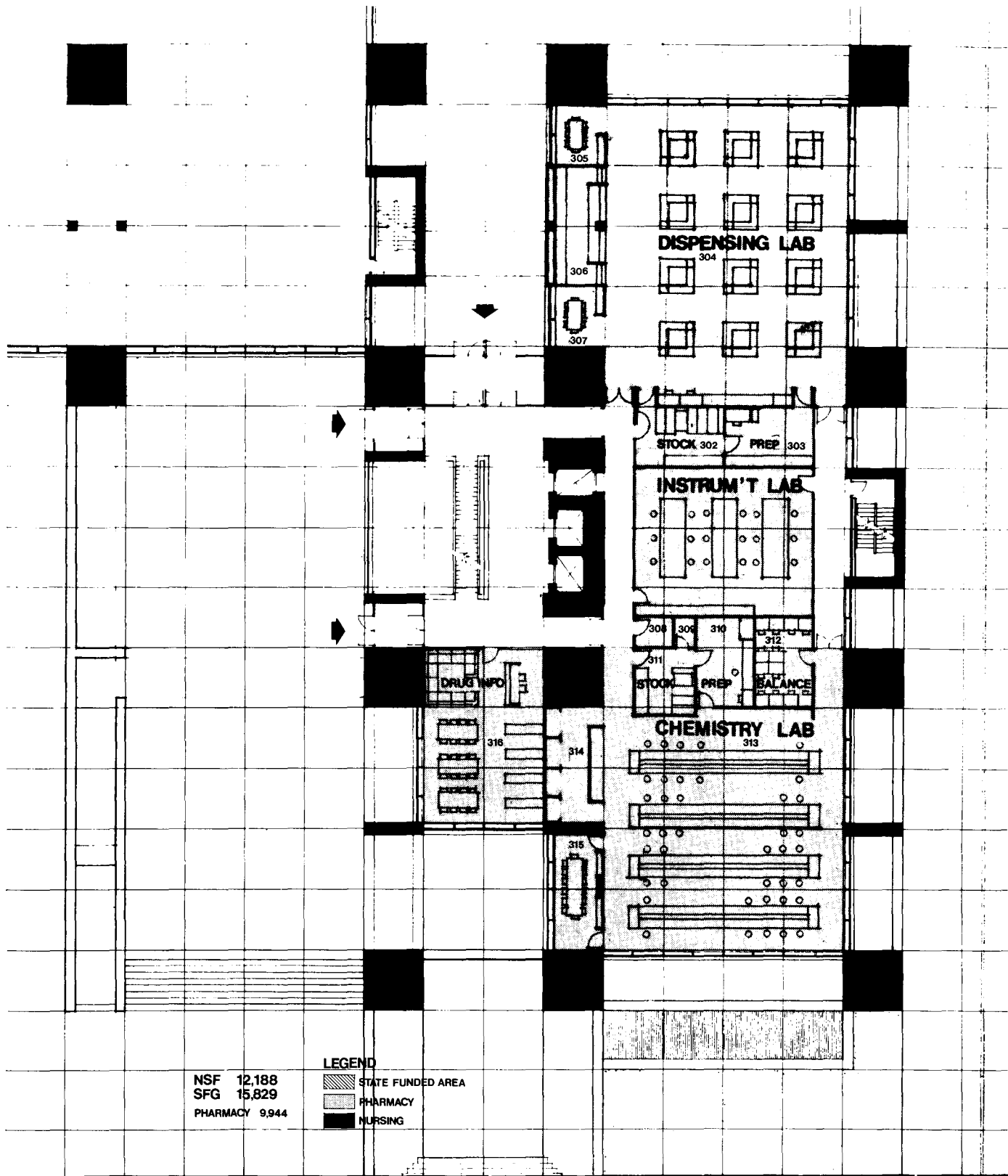
LEGEND	
	STATE FUNDED AREA
	PHARMACY
	NURSING

TAC	COLLEGE OF PHARMACY & SCHOOL OF NURSING	PROGRAM UNITS:	FLOOR
	UNIVERSITY OF MINNESOTA	SHARED FACILITIES	2
	HEALTH SCIENCES EXPANSION	PHARMACY UNDER GRAD LAB	

Floor 3 Unit F

ROOM NUMBER	ROOM ASSIGNMENT	ROOM NAME	SFN PER ROOM	TOTAL ASSOC	TOTAL UNASS	TOTAL SFN	TOTAL SFG
F3-99		Corridor		2194			
301	P	Instrument Lab	1170				
302	P	Stock	226				
303	P	Prep	226				
304	P	Dispensing Lab	3176				
305	P	Conf.	127				
306	P	Drug Display	225				
307	P	Conf.	127				
308		Janitor Clo.		50			
309	P	Storage	28				
310	P	Prep Lab	226				
311	P	Stock	172				
312	P	Balance	226				
313	P	Chemistry Lab	2568				
314	P	Fume Lab	304				
315	P	Conf.	256				
316	HSS	Drug Info	887				
		TOTAL	9,944	2,244	3,641	12,188	15,829

P - College of Pharmacy
 N - School of Nursing
 HSS - Health Sciences Shared Space (Applicant space)



NSF 12,188
 SFG 15,829
 PHARMACY 9,944

LEGEND
 [Hatched Box] STATE FUNDED AREA
 [Dotted Box] PHARMACY
 [Solid Black Box] NURSING

TAC

COLLEGE OF PHARMACY & SCHOOL OF NURSING
 UNIVERSITY OF MINNESOTA
 HEALTH SCIENCES EXPANSION

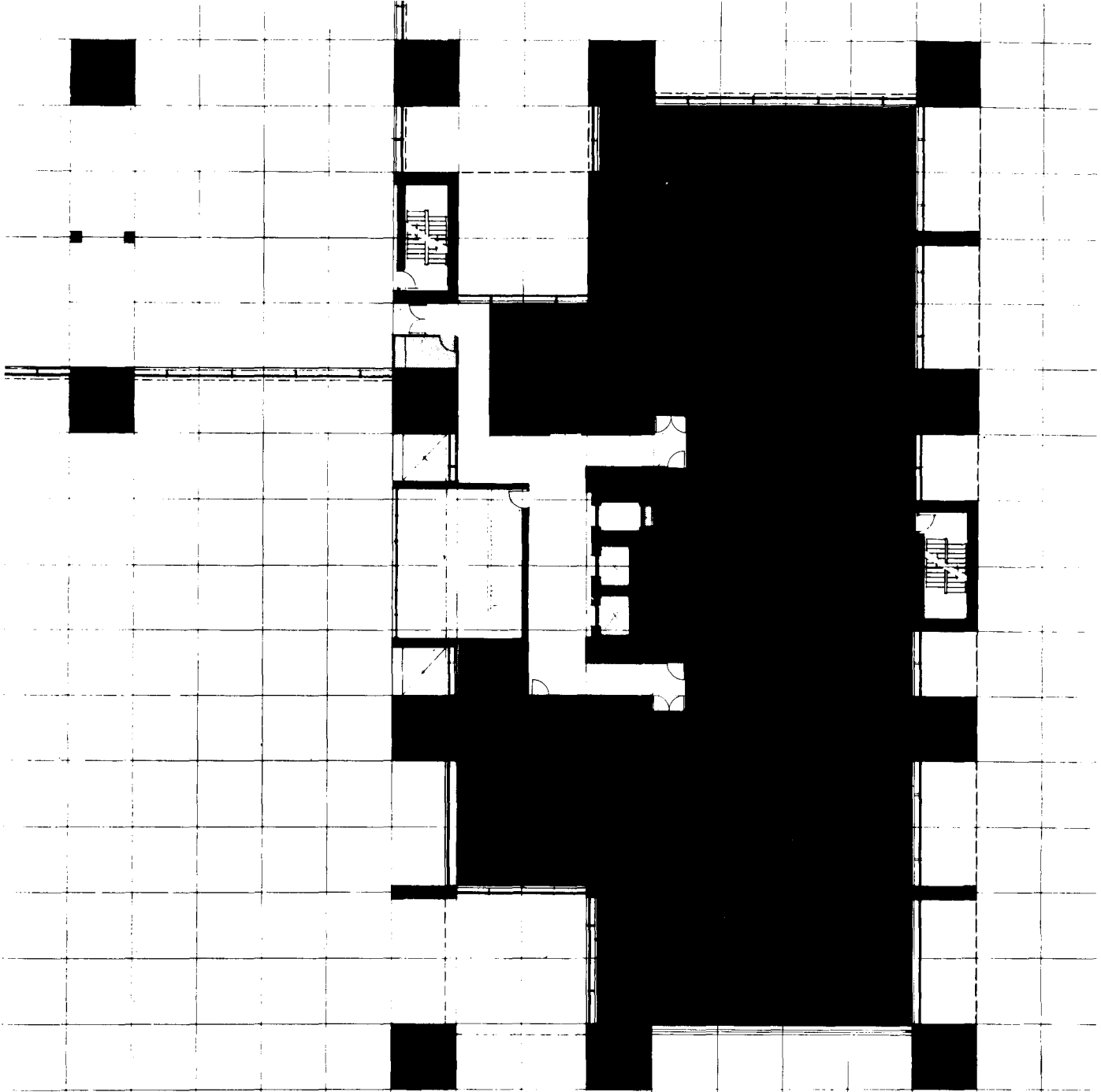
PROGRAM UNITS:
 SHARED FACILITIES
 PHARMACY UNDER GRAD LAB

FLOOR
3

Floor 4 Unit F

ROOM NUMBER	ROOM ASSIGNMENT	ROOM NAME	SFN PER ROOM	TOTAL ASSOC	TOTAL UNASS	TOTAL SFN	TOTAL SFG
F4-99		Corridor		1365			
401	N	AV Storage & Assembly	350				
402	N	Nursing Skills Lab	3302				
403	N	Helping Relation Group Lab	300				
404	N	Helping Relation Group Lab	300				
405	N	Helping Relation Group Lab	1200				
406	N	Helping Relation Ind Lab	2600				
407	N	Children's Observ. Lab	1000				
408	N	Children Lab	200				
409	N	Health Assessments Lab Tea.	200				
410	N	Health Assessments Lab	1200				
		TOTAL	10,652	1,365	4,311	12,017	16,328

P - College of Pharmacy
 N - School of Nursing
 HSS - Health Sciences Shared Space (Applicant space)



NSF 12,017
 SFG 16,328
 NURSING 10,852

LEGEND
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 [Grey Box] PHARMACY
 [Black Box] NURSING

TAC

COLLEGE OF PHARMACY & SCHOOL OF NURSING
 UNIVERSITY OF MINNESOTA
 HEALTH SCIENCES EXPANSION

PROGRAM UNITS:
 NURSING

FLOOR

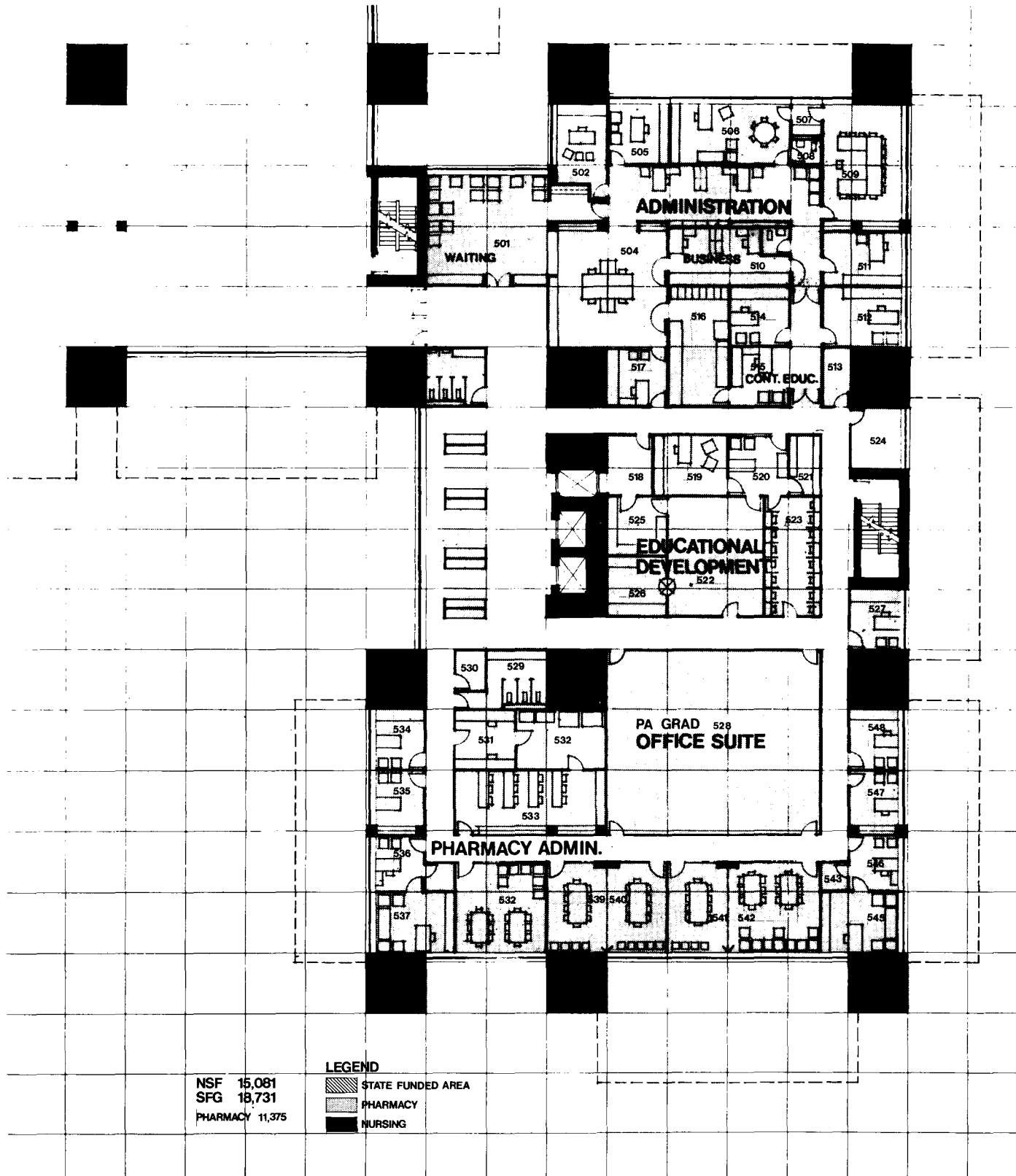
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Floor 5 Unit F

ROOM NUMBER	ROOM ASSIGNMENT	ROOM NAME	SFN PER ROOM	TOTAL ASSOC	TOTAL UNASS	TOTAL SFN	TOTAL SFG
F5-99		Corridor		3336			
501	P	Waiting	598				
501A		W-Toilet		152			
502	P	Ass. Dean	168				
503	P	Administration Office	532				
504	P	Joint Offices	578				
505	P	Ass. Dean	152				
506	P	Dean	304				
507	P	Prep Room	40				
508	P	Private Toilet	36				
509	P	Conf	430				
510	P	Business Office	304				
511	P	Office	228				
512	P	Office	228				
513	P	Storage	76				
514	P	Office	152				
515	P	Cont. Educ.	152				
516	P	Supplies	304				
517	P	Office	152				
518	P	Storage	110				
519	P	Office	191				
520	P	Office	152				
521	P	Storage	78				
522	HSS	Shared Office Space	426				
523	HSS	Classroom	336				
524	P	Storage	152				
525	P	Storage	152				
526	P	Inst. Room	152				
527	P	Office	127				
528	P	PA. Grad Office Suite	1810				

529		W-Toilet		168				
530		Janitor		52				
531	P	Inst. Storage	152					
532	P	Inst. Repair	226					
533	P	Inst. Room	339					
534	P	Office	127					
535	P	Office	130					
536	P	Office	117					
537	P	Office	201					
538	P	Conf.	320					
539	P	Conf.	226					
540	P	Conf.	226					
541	P	Conf.	226					
542	P	Conf.	320					
543	P	Storage	36					
544	P	Office	226					
545	P	Office	127					
546	P	Office	127					
547	P	Office	127					
		TOTAL	11,373	3,708	3,650	15,081	18,731	

P - College of Pharmacy
 N - School of Nursing
 HSS - Health Sciences Shared Space (Applicant space)



TAC

COLLEGE OF PHARMACY & SCHOOL OF NURSING
 UNIVERSITY OF MINNESOTA
 HEALTH SCIENCES EXPANSION

PROGRAM UNITS:
 PHARMACY

FLOOR

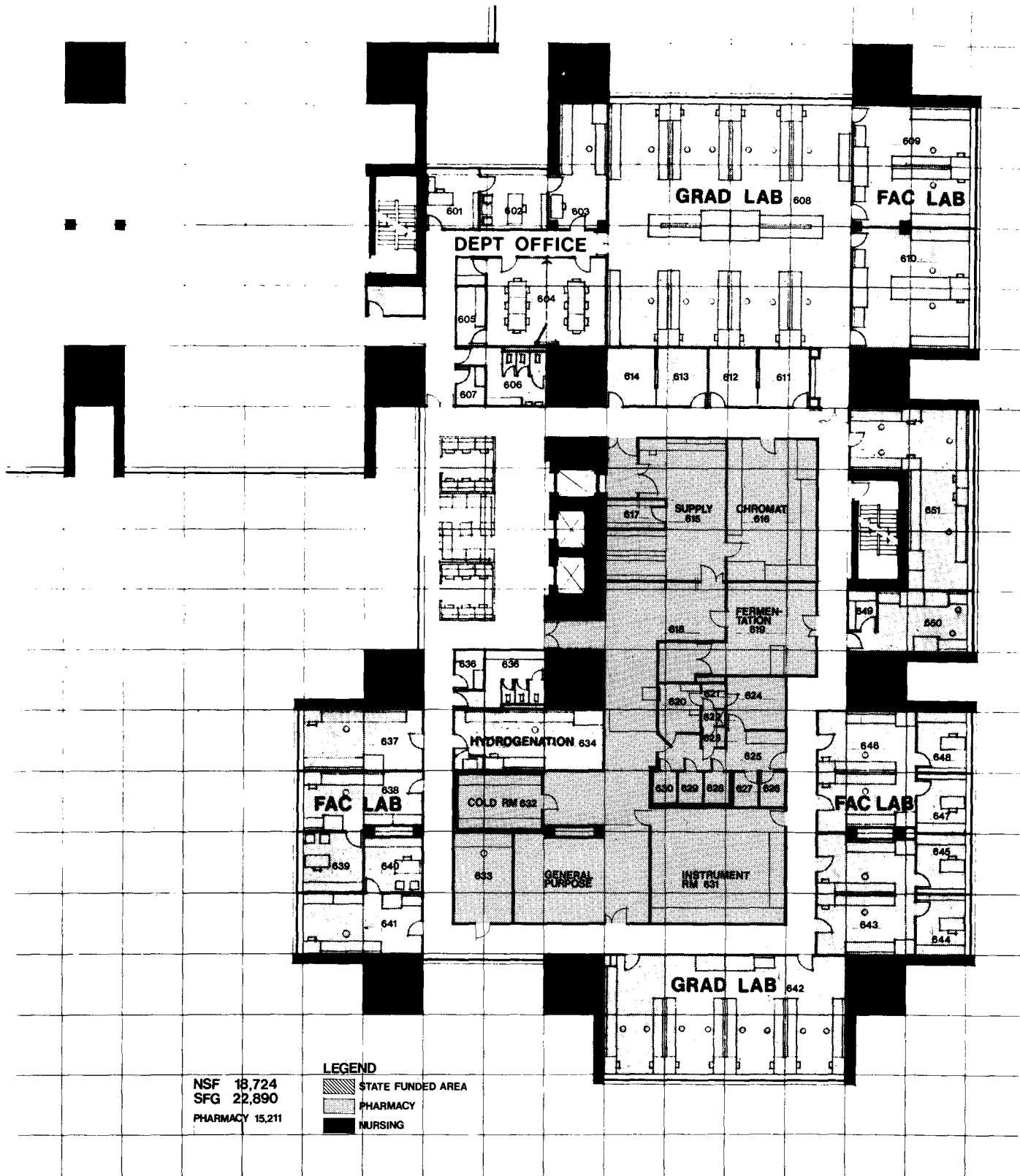
5

Floor 6 Unit F

ROOM NUMBER	ROOM ASSIGNMENT	ROOM NAME	SFN PER ROOM	TOTAL ASSOC	TOTAL UNASS	TOTAL SFN	TOTAL SFG
F6-99		Corridor		3065			
601	P	Sec	110				
602	P	Dept Head	144				
603	P	Dept Head Lab	278				
604	P	Conf	452				
605	P	AV. Storage	74				
605A	P	Kitchen	36				
606		M-Toilet			176		
607		Jan.			48		
608	P	Grad Lab	2608				
609	P	Fac Office	608				
610	P	Fac Lab	608				
611	P	Faculty Office	124				
612	P	Faculty Office	124				
613	P	Faculty Office	124				
614	P	Faculty Office	124				
615	P	Supply	553				
616	P	Chromat	541				
617	P	Storage	74				
618	P	Gen Purpose Lab	1174				
619	P	Fermentation	348				
619A	P	Sterilizer RM	64				
620	P	Clean Rm	90				
621	P	Lam Flow Rm	25				
622	P	Shower	25				
623	P	Locker Rm	25				
624	P	Transfer Rm	135				
625	P	Const Temp	188				
626	P	Micro	41				
627	P	Micro	41				
628	P	E.C.R.	41				

629	P	E.C.R.	41				
630	P	E.C.R.	41				
631	P	Instrument	662				
632	P	Cold Rm	226				
633	P	Grad Lab	226				
634	P	Hydrogenation	382				
635		W-Toilet			176		
636		Janitor Clo			48		
637	P	Post Dock Lab	304				
638	P	Fac Lab	304				
639	P	Office	152				
640	P	Office	152				
641	P	Fac Lab	304				
642	P	Grad Lab	1216				
643	P	Fac Lab	501				
644	P	Office	127				
645	P	Office	127				
645	P	Fac Lab	501				
647	P	Office	127				
648	P	Office	127				
649	P	Dark Rm	48				
650	P	Rad Rm	256				
651	P	Grad Lab	608				
		TOTAL	15,211	3,513	4,166	18,724	22,890

P - College of Pharmacy
 N - School of Nursing
 HSS - Health Science Shared Space (Applicant space)



NSF 18,724
 SFG 22,890
 PHARMACY 15,211

LEGEND
 [Hatched Box] STATE FUNDED AREA
 [Stippled Box] PHARMACY
 [Solid Black Box] NURSING

TAC

COLLEGE OF PHARMACY & SCHOOL OF NURSING
 UNIVERSITY OF MINNESOTA
 HEALTH SCIENCES EXPANSION

PROGRAM UNITS:
 PHARMACY : FACULTY
 GRADUATE STUDENTS

FLOOR

6

Floor 7 Unit F

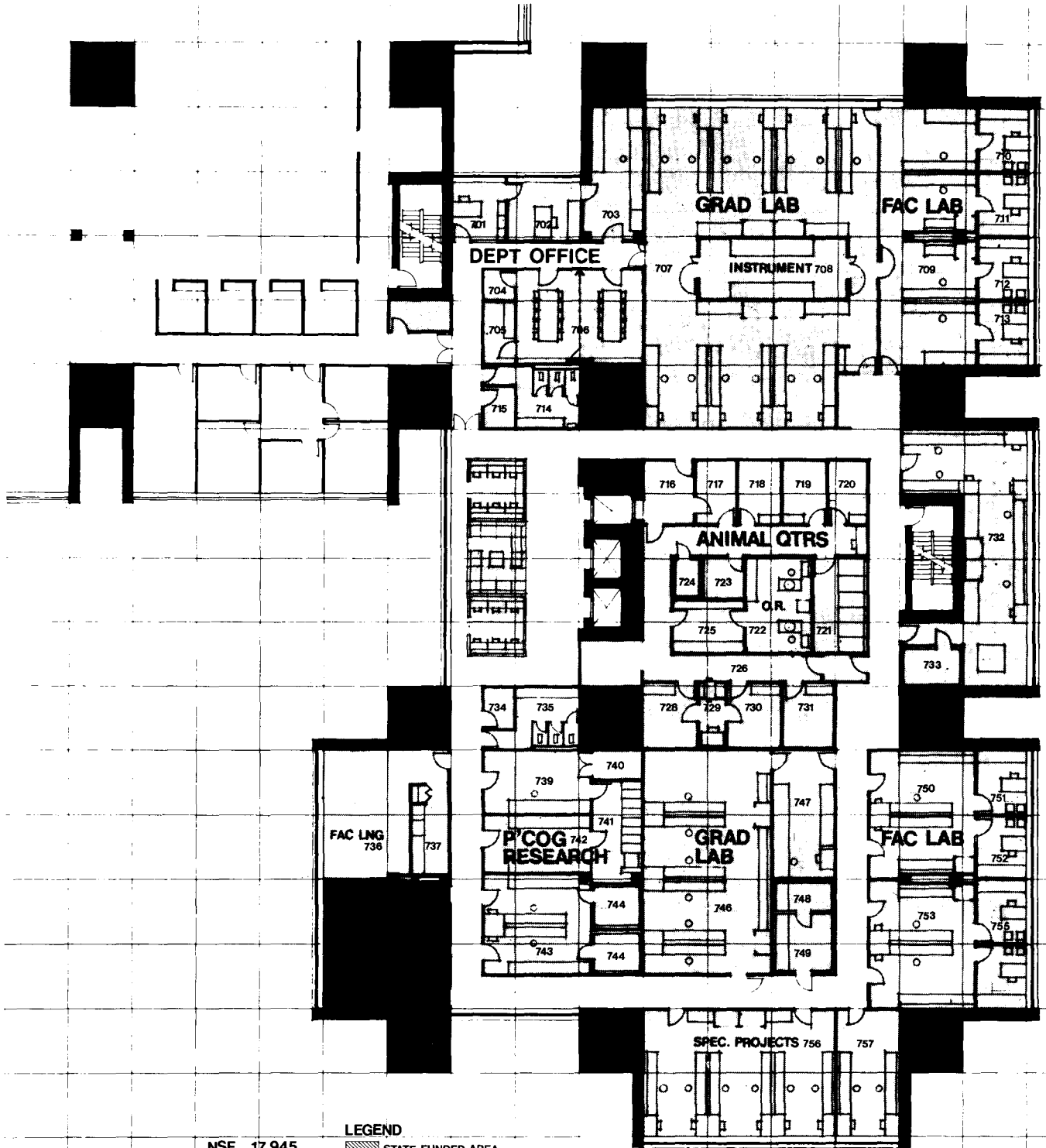
ROOM NUMBER	ROOM ASSIGNMENT	ROOM NAME	SFN PER ROOM	TOTAL ASSOC	TOTAL UNASS	TOTAL SFN	TOTAL SFG
F7-99		Corridor		3059			
701	P	Sec	110				
702	P	Office	144				
703	P	Dept Head Lab	278				
704	P	Kitchen	36				
705	P	AV Storage	74				
706	P	Conf	452				
707	P	Grad Lab	2083				
708	P	Instrument	353				
709	P	Fac Lab	900				
710	P	Office	127				
711	P	Office	127				
712	P	Office	127				
713	P	Office	127				
714		M-Toilet		176			
715		Janitor		48			
716	HSS	Receiving	111				
717	HSS	Animal	106				
718	HSS	Animal	106				
719	HSS	Animal	106				
720	HSS	Animal	94				
721	HSS	Dog Rm	200				
722	HSS	Surgery	242				
723	HSS	Feed Bed	65				
724	HSS	Cold Room	48				
725	HSS	Prep Recovery	144				
726	HSS	Corridor	400				
727	HSS	Storage	106				
728	HSS	Animal	123				
729	HSS	Injection	65				
730	HSS	Animal	131				

731	HSS	Animal	123				
732	P	Med Chem Grad Lab	710				
733	P	E.C.R.	90				
734		Janitor				48	
735		W-Toilet				176	
736	P	Faculty Lounge	461				
737	P	Vending	127				
738	N	Nursing Lab	578				
739	P	Drying & Milling	254				
740	P	Dust Rm	53				
741	P	Drug Storage	200				
742	P	Extraction Lab	234				
743	P	Post Dock Lab	405				
744	P	Envir Plants	87				
745	P	Envir Plants	80				
746	P	Grad Lab	900				
747	P	Test & Cont	304				
748	P	E.C.R.	73				
749	P	E.C.R.	152				
750	P	Fac Lab	450				
751	P	Fac Office	127				
752	P	Fac Office	127				
753	P	Fac Lab	450				
754	P	Office	127				
755	P	Office	127				
756	P	Spec Prov Lab	910				
757	P	C.P. Office Lab	304				
		TOTAL	14,438	3,507	4,945	17,945	22,890

P - College of Pharmacy




N - School of Nursing

HSS - Health Science Shared Space (Applicant space)



NSF 17,945
 SFG 22,890
 PHARMACY 578
 NURSING 13,880

LEGEND

-  STATE FUNDED AREA
-  PHARMACY
-  NURSING

TAC

COLLEGE OF PHARMACY & SCHOOL OF NURSING
 UNIVERSITY OF MINNESOTA
 HEALTH SCIENCES EXPANSION

PROGRAM UNITS:

SHARED FACILITIES
 PHARMACY : FACULTY
 GRADUATE STUDENTS

FLOOR

7

Floor 8 Unit F

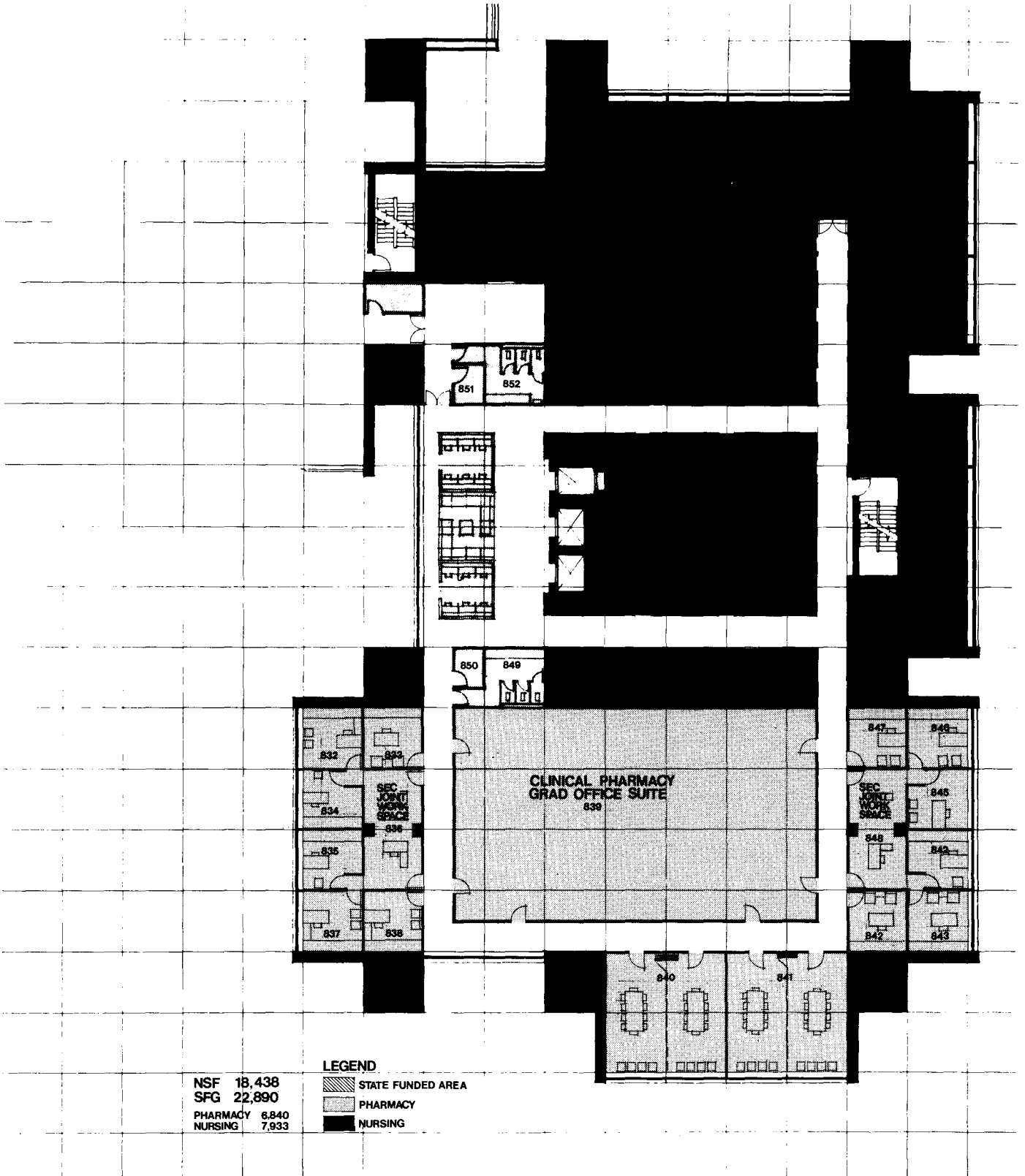
ROOM NUMBER	ROOM ASSIGNMENT	ROOM NAME	SFN PER ROOM	TOTAL ASSOC	TOTAL UNASS	TOTAL SFN	TOTAL SFG
F8-99		Corridor		3217			
801	N	Waiting	608				
802	N	Ass Dean	152				
803	N	Administration Office	608				
804	N	Ass Dean	152				
805	N	Assoc Dean	152				
806	N	Dean	226				
807	N	Conference Prep Area	36				
808	N	Staff Toilet	36				
809	N	Conf	304				
810	N	Shared Office	227				
811	N	Office	152				
812	N	Shared Office	227				
813	N	Office	152				
814	N	Staff Toilet	36				
815	N	Machine Rm, Duplicating	191				
816	N	Work Room	227				
817	N	Shared Office	227				
818	N	Office	142				
819	N	Office	142				
820	N	Office	142				
821	N	Sec Joint Work	790				
822	N	Sec Joint Work	1139				
823	N	Office	143				
824	N	Office	143				
825	N	Office	143				
826	N	Conf	304				
827	N	Research Support	1549				
828	N	Office	131				
829	N	Office	131				
830	N	Office	131				

831	N	Office	131				
832	N	Office	152				
833	N	Office	152				
834	N	Office	152				
835	N	Office	152				
836	N	Storage space	304				
837	N	Office	152				
838	N	Office	152				
839	P	Clinical Pharm Grad Office					
		Suite	2251				
840	P	Conf	608				
841	P	Conf	608				
842	P	Office	152				
843	P	Office	152				
844	P	Office	152				
845	P	Office	152				
846	P	Office	152				
847	P	Office	152				
848	P	Sec Joint Work Space	304				
849		M-Toilet			176		
850		Janitor Clo.			48		
851		W-Toilet			176		
852		Janitor Clo			48		
		TOTAL	14,823	3,665	4,452	18,434	22,890

P - College of Pharmacy

N - School of Nursing

HSS - Health Sciences Shared Space (Applicant space)



NSF 18,438
 SFG 22,890
 PHARMACY 6,840
 NURSING 7,933

LEGEND
 [Hatched Box] STATE FUNDED AREA
 [Stippled Box] PHARMACY
 [Solid Black Box] NURSING

TAC

COLLEGE OF PHARMACY & SCHOOL OF NURSING
 UNIVERSITY OF MINNESOTA
 HEALTH SCIENCES EXPANSION

PROGRAM UNITS:

NURSING
 CLINICAL PHARMACY

FLOOR

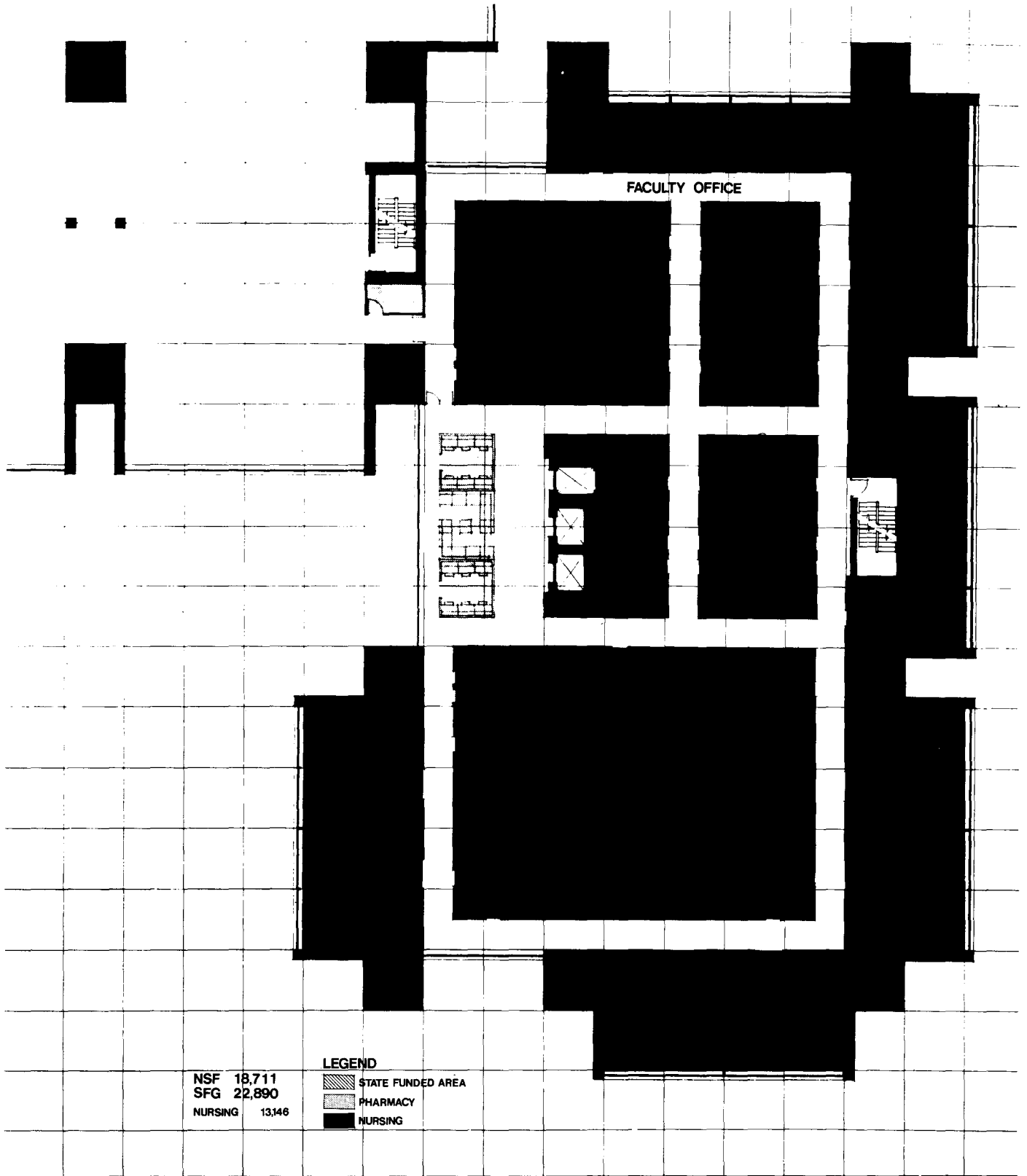
8

Floor 9 Unit F

ROOM NUMBER	ROOM ASSIGNMENT	ROOM NAME	SFN PER ROOM	TOTAL ASSOC	TOTAL UNASS	TOTAL SFN	TOTAL SFG
F9-99		Corridor		5117			
901	N	Fac Office	127				
902	N	Fac Office	152				
903	N	Fac Office	152				
904	N	Fac Office	152				
905	N	Fac Office	152				
906	N	Fac Office	152				
907	N	Shared Office	304				
908	N	Faculty Office Suite	779				
909	N	Fac Office	127				
910	N	Fac Office	127				
911	N	Fac Office	127				
912	N	Fac Office	127				
913	N	Fac Office	127				
914	N	Fac Office	127				
915	N	Fac Office	127				
916	N	Fac Office	127				
917	N	Fac Office	127				
918	N	Fac Office	127				
919	N	Fac Office	127				
920	N	Fac Office	127				
921	N	Fac Office	127				
922	N	Fac Office	304				
923	N	Fac Office	152				
924	N	Fac Office	152				
925	N	Fac Office	152				
926	N	Fac Office	152				
927	N	Fac Office	152				
928	N	Fac Office	152				
929	N	Fac Office	152				
930	N	Fac Office	152				

931	N	Fac Office	152				
932	N	Fac Office	152				
933	N	Conference	608				
934	N	Conf	304				
935	N	Faculty Office Suite	3724				
936	N	Fac Office	152				
037	N	Shared Office	304				
938	N	Shared Office	304				
939	N	Fac Office	152				
940	N	Fac Office	152				
941	N	Fac Office	152				
942	N	Fac Office	152				
943	N	Shared Office	304				
944	N	Shared Office	304				
945	N	Fac Office	152				
946	N	Fac Office	152				
947	N	Shared Office	304				
948	N	Shared Office	304				
949	N	Fac Office	152				
950	N	Fac Office	152				
951		W-Toilet		176			
952		Janitor		48			
953		M-Toilet		176			
954		Janitor		48			
		TOTAL	13,146	5,565	4,179	18,711	22,890

P - College of Pharmacy
 N - School of Nursing
 HSS - Health Sciences Shared Space (Applicant space)



NSF 18,711
 SFG 22,890
 NURSING 13,146

LEGEND
 [Diagonal Lines] STATE FUNDED AREA
 [Grid Pattern] PHARMACY
 [Black] NURSING

TAC

COLLEGE OF PHARMACY & SCHOOL OF NURSING
 UNIVERSITY OF MINNESOTA
 HEALTH SCIENCES EXPANSION

PROGRAM UNITS:
 NURSING

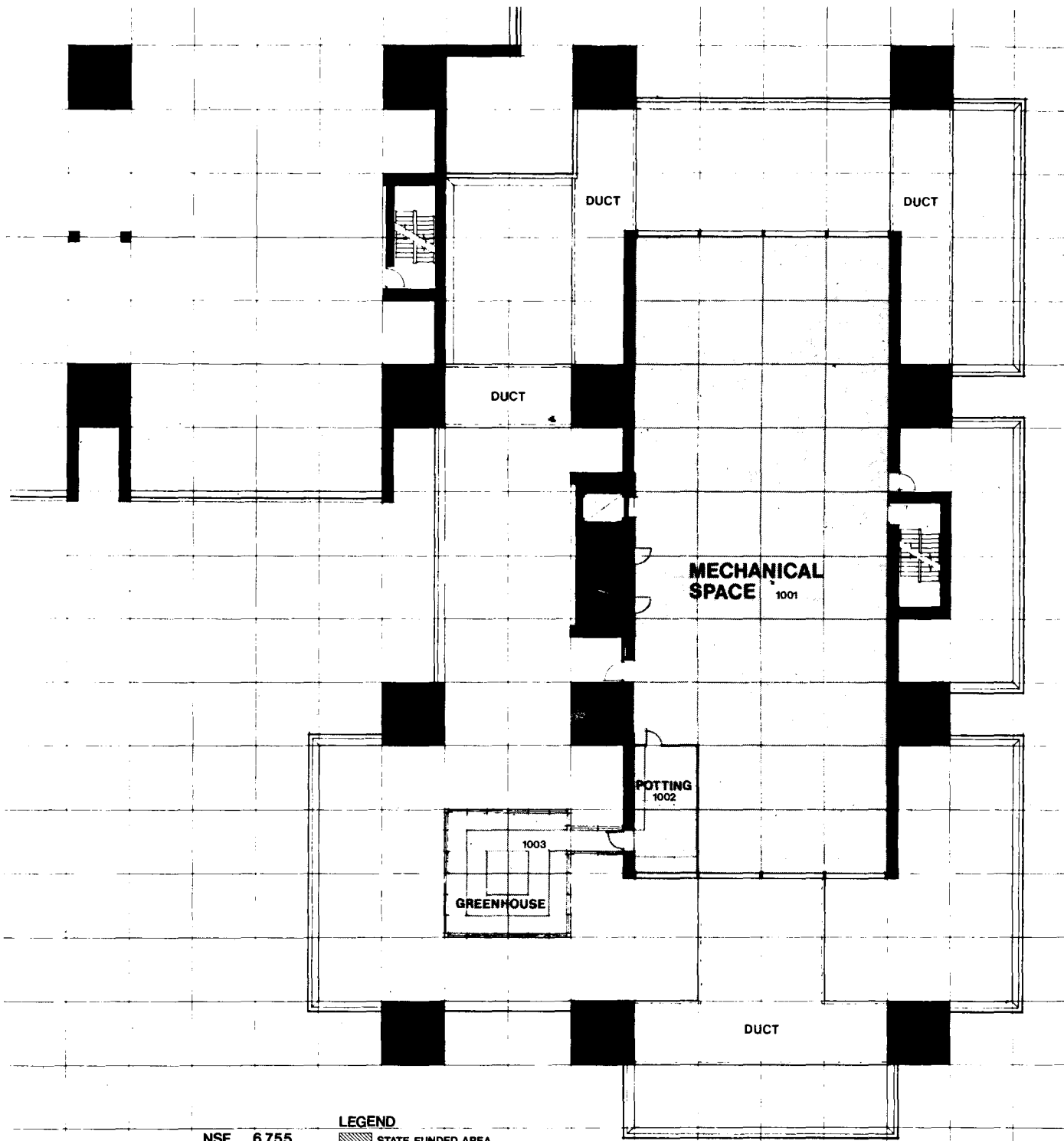
FLOOR

9

Floor 10 Unit F




ROOM NUMBER	ROOM ASSIGNMENT	ROOM NAME	SFN PER ROOM	TOTAL ASSOC	TOTAL UNASS	TOTAL SFN	TOTAL SFG
1001		Mechanical Space		5776			
1002	P	Potting	304				
1003	P	Greenhouse	675				
		TOTAL	979	5,776	5,535	6,755	12,290

P - College of Pharmacy
 N - School of Nursing
 HSS - Health Sciences Shared Space (Applicant space)



NSF 6,755
 SFG 12,290
 PHARMACY 979

LEGEND

-  STATE FUNDED AREA
-  PHARMACY
-  NURSING

TAC

COLLEGE OF PHARMACY & SCHOOL OF NURSING
 UNIVERSITY OF MINNESOTA
 HEALTH SCIENCES EXPANSION

PROGRAM UNITS:
 PHARMACY

FLOOR
10

E. Space Utilization Following Completion of the Proposed Project

SUMMARY OF SPACE CONTROLLED BY THE APPLICANT

	<u>Total</u>	<u>New Assignable Square Feet (NASF)</u>		<u>Number of Student Stations</u>	
		<u>Total Utilized</u>	<u>Usable by Program</u>	<u>Total</u>	<u>Usable by Program</u>
Classroom-type instructional space*	0	--	--	--	--
Laboratory-type instructional space	13,210	13,210	13,210	171	171
Library space*	0	--	--	--	--
Auditoriums*	0	--	--	--	--
Administrative Offices and Areas	4,469	4,469	4,469	xxx	xxx
Faculty Offices	5,230	5,230	5,230	xxx	xxx
Research and Research Training Space**	25,817	25,817	25,817	xxx	xxx
Animal Facilities*	0	--	--	xxx	xxx
Other Space	7,658	7,658	7,658		

Total (Exclusive
of Patient Care Facilities) 56,384 sq.ft.

* Health Sciences Shared Space

** Includes work space for faculty and graduate students as well
as specialized research work space (e.g., tissue culture
transfer areas, chromatography areas, instrument rooms).

Utilization of Instructional Classrooms and Laboratories

Hours per year Spent by a Typical Full
Time Student in Areas Controlled by the
Applicant School

	A	B	C
	Total Columns <u>B & C</u>	<u>Classrooms*</u>	<u>Instructional Laboratories</u>
First year undergraduate	288	216	72
Second year undergraduate	684	432	252
Third year undergraduate	432	360	72
Fourth year undergraduate	108	108	0
Fifth year undergraduate	--	--	--
Sixth year undergraduate	--	--	--
Graduate Students enrolled for degree	<u>1110</u>	<u>360</u>	<u>750</u>
Total.....	2612	1476	1146

Academic Year

	<u>1 & 2</u>	<u>3 & 4</u>
Number of weeks in the Academic Year	36	48
Number of hours in the Academic Week	40	40

*Including small group classrooms (e.g., conference areas)

A very careful effort has been made to plan and create facilities to satisfy the programs described in Item 9 - Section III, while at the same time providing the flexibility needed to adapt to changing curriculum patterns and to changing professional roles of the pharmacist.

As the curriculum now stands, activity in the proposed facility will basically follow the same guidelines for the pharmaceutical sciences as are now followed in the present facility. Immediate benefits will be noted through increased enrollment capability, an environment in which all health sciences are represented, ability to provide lower student to faculty ratios, the availability of various educational support systems to aid in providing the relevancy and individuality needed in the curriculum, and an easing of current space deficiencies.

Based upon the spring quarter (due to the heaviest lecture schedule), the program for the 5-year curriculum indicates that for the required courses within the College of Pharmacy, 35 lecture hours per week are delivered. A majority of these lecture hours must be provided in the morning between the

hours of 8 a.m. and 12 noon. This is based upon the necessity of having afternoons free for laboratory offerings. These 35 hours will in effect more than take up the possible morning scheduling of the 2 - 150 seat lecture halls. Additional large classroom space, if needed, will be available through Unit A, and reciprocately the Health Sciences and the University will schedule needed time within Unit F. It should be pointed out that no other 150 seat classrooms have been planned for in Phase I construction.

A majority of the conference/seminar rooms have been planned to accommodate joint functions. These functions may include departmental reading rooms, student study areas, lounge areas, or media preparation space. The 35 classroom hours indicated above do not take into account space needed for small group interactions, lecture areas for the Doctor of Pharmacy program, or seminar space. These activities will be assigned space from the conference/seminar rooms and/or from the larger auditoria as necessary.

<u>Floor</u>	<u>Area Designation</u>	<u>Capacity</u>	<u>Average Student Occupancy</u>	<u>Use* (Hrs/wk)</u>
2	Classroom	75	50-75	40
2	Classroom	75	50-75	40
2	Auditorium	150	125-150	40
2	Auditorium	150	125-150	40

*Includes utilization by other health science units.

The following table indicates the laboratory usage for the conventional 5-year curriculum, the Doctor of Pharmacy program, and the Medical Technology program.

	Pharmaceutical Processes Lab	Biological Processes Lab	Chemical Processes Lab
Quarter			
FALL	(xx)(xx)	00 0	(xx) 0
WINTER	(xx)(xx)00	0 (xx)	(xx) 0
SPRING	(xx)(xx)00	0 (xx)	0

KEY: (xx) 5-year program. Two sections for each course.
 0 Doctor of Pharmacy specialization program.

Each letter in the above table represents a laboratory period of from 3 to 4 hours each. Not shown is a designation of the time needed for laboratory preparation and set-up. The proposed scheduling is based on the traditional 'formal' laboratory period. However, it should be kept in mind that the concept of 'open' laboratories where students work at their own pace is gaining rapid acceptance. The existing undergraduate Medicinal Chemistry laboratory is of this type and it is expected that others will follow their example in the near future.

The table also does not show graduate level instructional use of the teaching laboratories. A number of graduate courses in pharmacy will be utilizing this space, especially that found in the biological processes

laboratory which has been designated to accommodate advanced levels of learning in the life sciences.

Based upon the above rationale, the following utilization chart can be made for the undergraduate teaching laboratories.

Floor	Area Designation	Capacity	Average Student Occupancy	Use (Hrs/wk)
2	Biological Processes Undergraduate Lab and related space	48	40-48	40*
3	Chemical processes Undergraduate Lab and related space	75	70-75	40**
3	Pharmaceutical processes Undergraduate Lab and related space	48	40-48	40
5	Calculations Lab (U.G.)	12	12	24

It should be mentioned that the growth of the Doctor of Pharmacy specialization program with its many options will make unknown demands for classroom and laboratory space. This has not been projected beyond the minimal expectations.

*Including use by graduate students

**Based on an "open-lab" format

In accordance with the policy of placing the greatest emphasis on the individual student, numerous areas within the building (Unit F) and within the other areas of the Health Sciences Center have been designated to complement this individuality. Within Unit F are found student conference rooms, locker rooms, laboratory reference areas, discussion rooms, the drug information center, demonstration and study carrels within the laboratories, and lounge and vending facilities. To aid in the education process, space has also been included for an Educational Development Center, a computer center, and a Continuing Education Administrative suite. In addition, the Health Sciences Center as a whole will provide library and study space, the Learning Resources Center, and lounge space for all health sciences personnel.

F. Animal Facility Analysis:

Current animal facilities for the College of Pharmacy are located in Appleby Hall. They consist of a complex of four small interconnected rooms, one of which serves as an operating and general work area with the remaining three rooms providing the actual housing. With no Pharmacology offerings in the College itself, no great inadequacies as far as space needs are concerned have been noted in the past. This has relieved the animal needs for both the undergraduate and graduate programs. However, as Biopharmaceutics continues to expand and as a greater emphasis is placed upon biological orientation within all disciplines, a greater need for space and improved facilities has ensued; again involving both the undergraduate and the graduate programs.

In regard to the status of animal quarters serving the remainder of the Health Sciences -- these are currently located in the research areas of seven different buildings of the medical complex. Approximately 50% of the animals at this institution are cared for by personnel of the departments using the animals. The remainder of the animals are under the care of the personnel of the Research Animal Hospital. The School of Dentistry is providing approximately 6000 square feet of space on the 19th level of Unit A for their needs, while major expansion for the Research Animal Hospital will be provided for through Unit B/C.

Although a close working relationship will be developed between Pharmacy and the remainder of the health sciences in regard to animal needs, a certain amount of space will be necessary for housing animals under experimentation. The School of Nursing (which has need for minimal animal space) will share these facilities and the space is considered as being health sciences shared space.

No facilities for breeding and raising our own animals are planned. All animals will be ordered as needed either direct from involved companies or through the Research Animal Hospital. Housing, therefore, will be minimal except in cases of prolonged experimentation.

The lay-out will allow for separation of all animal species (seven small rooms plus a dog room) and will also allow for maximum flexibility with regard to possible variations in program. The separation of species, along with refuse isolation, feed isolation, separate receiving area, surgery area, recovery area, and the availability of a room for quarantine and isolation, will minimize the possibility of disease outbreaks and resulting contamination problems.

Facilities for the cleaning and sterilization of individual small cages will be made available within the cleaning and equipment room. The bulk of the cage washing (i.e., large cages and racks of cages) and general upkeep of the animals and their quarters however, will be provided through cooperation with the Research Animal Hospital. The Animal room complex will have direct service elevator connection with the service corridor on level 1 which leads to the Research Animal Hospital facilities. This is a service corridor and as such does not provide public access.

Animal deliveries to the Research Animal Hospital are made via a separate service dock, the access of which is through the Mayo underground garage. Distribution throughout the Health Sciences complex will then be carried out from this point. Small animal purchases are normally direct through

central stores while the purchase of all other animals will be coordinated by the Research Animal Hospital.

Animal health care provisions are available also through the Research Animal Hospital in conjunction with the College of Veterinary Medicine's holding facilities.

Daily carcass and refuse disposal will be provided by the University. The separate refuse storage area will have refrigeration for such storage needed until the time of pick-up and disposal. The refuse will be adequately bagged within the refuse storage area and at the time of disposal will be brought to the service corridor on level 1 via the service elevator.

It is recognized that the main problem arising out of the University's organization regarding research animals is that of dealing with animal transportation. It is for this reason that a separate isolated service corridor horizontally connecting all Health Sciences units at level 1 was established. Vertical movement in other units which have a high degree of animal traffic is accommodated by a separate animal service elevator. Unit F, by comparison, has a relatively low degree of animal traffic contemplated at this time and, therefore, it was felt a combination passenger-freight elevator would be satisfactory. Detailed analysis of both passenger and service movement, their volumes, frequencies, etc. has not been undertaken. Numerous possibilities exist and will be considered in terms of isolating animal movement by using various control techniques to complete isolation of elevator and shaftway. The full range of these alternatives will be examined concurrent with a detailed analysis of materials movement.

The placement of the animal facilities on the 7th floor of our proposed facility is based upon the premise that high density use facilities be situated on the more readily accessible lower levels while functions that require low level continuous activity be placed within the upper levels. Resultingly, classrooms, undergraduate laboratories, student facilities, and supply functions have been placed on the lower levels of Unit F. Supportive reasoning for placing the animal room complex on an upper level comes through the definition of the primary user. Biopharmaceutics, as well as other biologically oriented segments of our graduate program comprise this user group. All of these segments are on floors 6 and 7 of Unit F and Biopharmaceutics itself is on the same level as the animal room complex.

The minimal animal holding and experimentation facilities we are proposing are in line with completely centralized or coordinated University or Health Sciences animal facilities.

We are seeking cooperation in this area to eliminate duplication of facilities and in being able to provide the best possible care for the animals being housed.

G. Future Expansion

Future expansion of the Health Sciences Center beyond Phase I is indicated in the master campus plan (Part IV of this Section).

The College of Pharmacy has no future phased projects under consideration.

Unit F has been planned so that all floors can be expanded laterally one bay (approximately 62 feet) to the east. This will allow a potential increase of approximately 40% gross square feet at some future time if deemed necessary.

IV. Master Campus Plan

The University of Minnesota Health Sciences Expansion provides facilities for the consolidated units of the Health Sciences: School of Medicine, University Hospitals, School of Dentistry, School of Public Health, School of Nursing and the College of Pharmacy.

The complex of new and remodeled existing buildings comprising the Health Sciences Facilities is the architects' response to the University's goal of physical and curricular integration of the Health Sciences units with each other and the rest of the Minneapolis campus of the University.

The problem as defined by this goal was to develop a high density building system on a tight urban site with strong relationships to major existing facilities. This system needed to respond to the initial phase of expansion as well as to the continuing need for growth and change inherent in health sciences units.

The architects' initial effort was to develop a master plan which provided for short and long term expansion and responded to the integrated relationships called for in the program. This master plan serves as a framework for growth by establishing the major paths of circulation knitting together new and existing buildings. A centralized receiving unit (Unit K/E) is the focus of a separate service circulation network connecting existing buildings and new construction two floors below grade. One floor above that a major pedestrian spine with branches to existing buildings and new construction and in addition, a 3,000 car parking ramp provides the capability of moving to all parts of the Health Sciences without being exposed to the frequently severe weather (see diagram pages). Two floors above grade another enclosed connection is provided permitting access to all Health Sciences areas.

Phase I of the master plan is scheduled to be complete by December 1977. Phase I is comprised of Units A, B/C, K/E and F as shown on the site plan which follows this section.

Unit A, which houses the School of Dentistry, Basic Sciences teaching laboratories, shared Auditoria, and programs from the Schools of Public Health and Medicine has been under construction and Unit B/C is scheduled to be completed by December of 1976. The lower floors of Unit K/E, as previously mentioned, constitute the centralized receiving unit for the Health Sciences. The upper floors house a Cardiovascular Research and Teaching Center. Construction of this unit has been completed.

Unit F, the College of Pharmacy and School of Nursing, which is the subject of this application is currently in the planning stages. Construction is scheduled to begin early in 1976 with completion scheduled for late 1977.

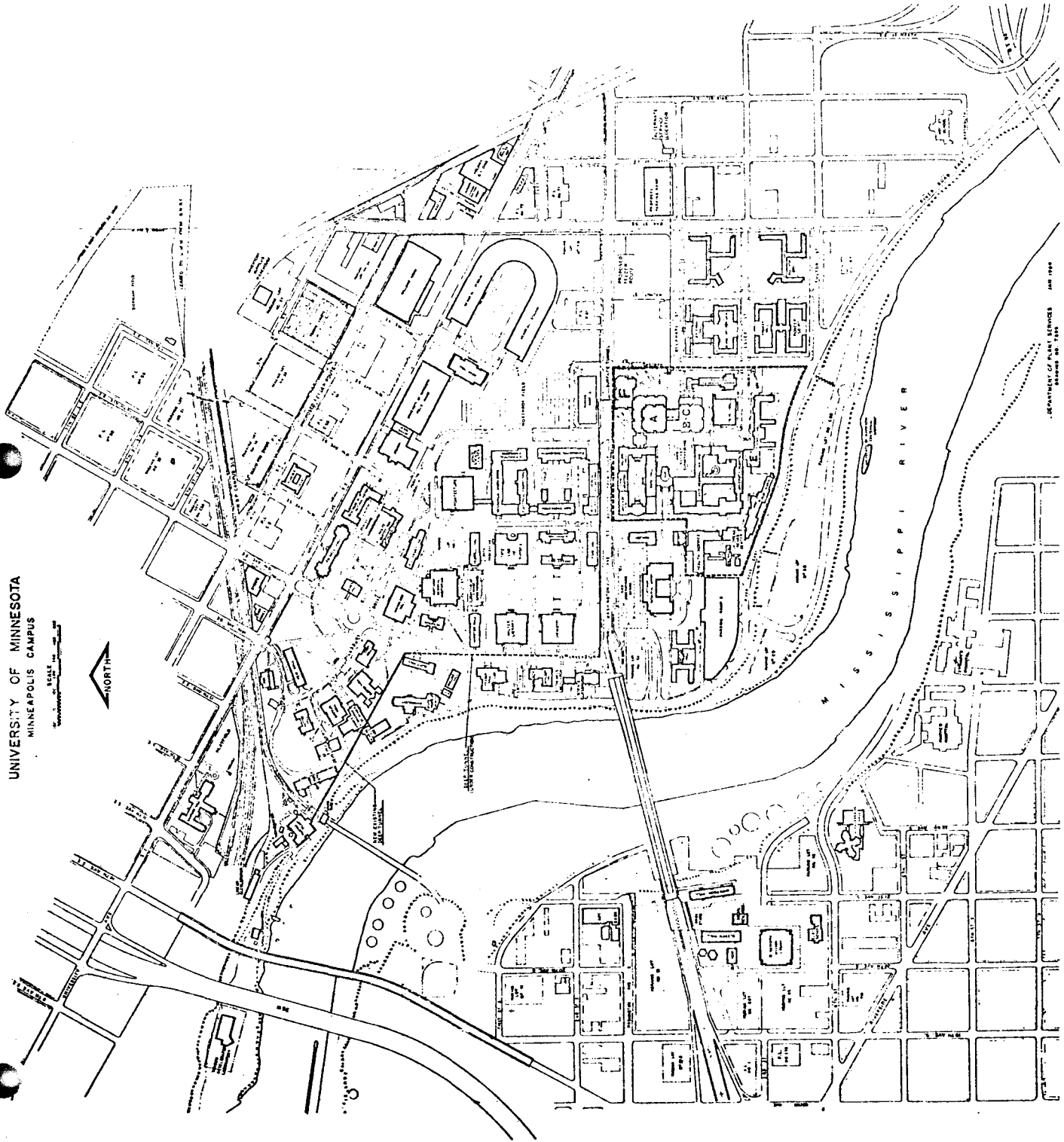
The University has prepared a long-range plan for parking and circulation on the Twin Cities Campus. The Health Sciences facilities program includes provision of a 3,000 car parking ramp which is being constructed simultaneously with the construction of Unit A. This ramp has first priority in the implementation of the overall parking plan. The University is also cooperating with the Metropolitan Transit Commission and other agencies to develop improved public transportation for the area. Among the possibilities being considered is a series of satellite parking lots connected to the University by a rapid transit system. Within the past year a system of express bus routes was initiated jointly between the University and the Metropolitan Transit Commission.

A long range plan for housing is now in preparation and although a high proportion of student and staff housing will, of necessity, be provided by the private sector, it is likely that plans will include some University owned apartments or town houses in the vicinity of the Health Sciences facilities. A low cost housing development is about to be constructed on University land 1 1/2 miles west of the Health Sciences facilities.

Forseeable expansion of the Health Sciences beyond the Phase I planned program for completion in 1976 includes: new facilities for the School of Public Health, Unit G; and a new hospital, Units J and H, to replace beds now located in the existing Mayo Building. Space vacated by these beds and other hospital functions will be remodeled and used for expansion in the areas of clinical teaching and research, student study spaces, faculty and administrative offices.

UNIVERSITY OF MINNESOTA
MINNEAPOLIS CAMPUS

SCALE
1" = 100'



LEGEND



HEALTH SCIENCES AREA

UNIT F (this application)

REMAINDER OF PHASE 1
(new construction)



UNIVERSITY OF MINNESOTA
HEALTH SCIENCES EXPANSION
MINNEAPOLIS, MINNESOTA

THE ARCHITECTS COLLABORATIVE, INC. CAMBRIDGE, MASS. &
THE HEALTH SCIENCES ARCHITECTS & ENGINEERS, INC.
MINNEAPOLIS, MINNESOTA
PROJECT: HEALTH SCIENCES EXPANSION
DESIGN: JACK & JUNGHEIMER, INC.
MINNEAPOLIS, MINNESOTA

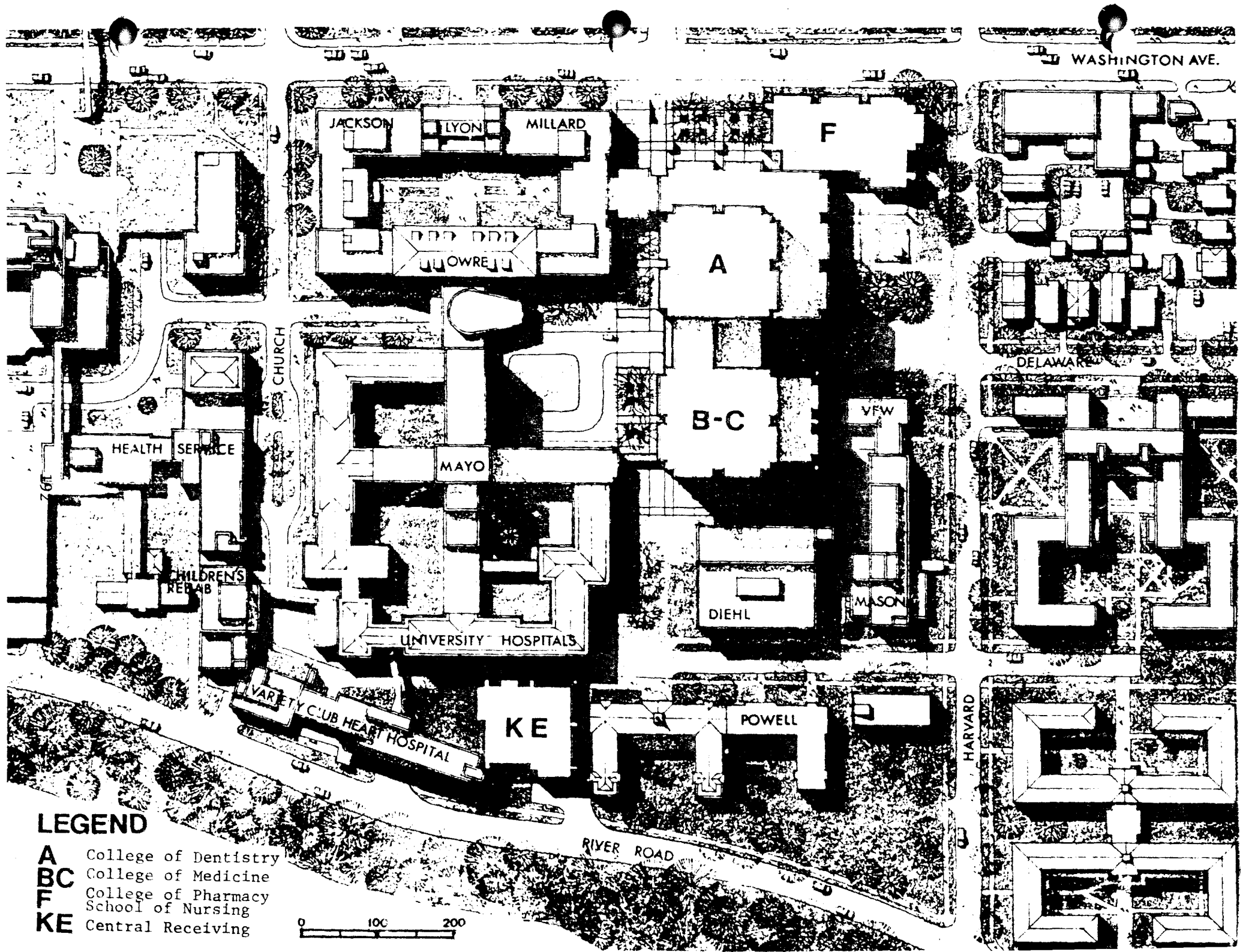
UNIT F

LOCATION PLAN

70048

1" = 200'
30 JUNE 71

SHEET 1



WASHINGTON AVE.

JACKSON LYON MILLARD

F

LOWREY

A

CHURCH

DELAWARE

B-C

VFW

HEALTH SERVICE

MAYO

MASON

CHILDREN'S REHAB

DIEHL

UNIVERSITY HOSPITALS

VARIETY CLUB HEART HOSPITAL

KE

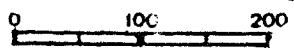
POWELL

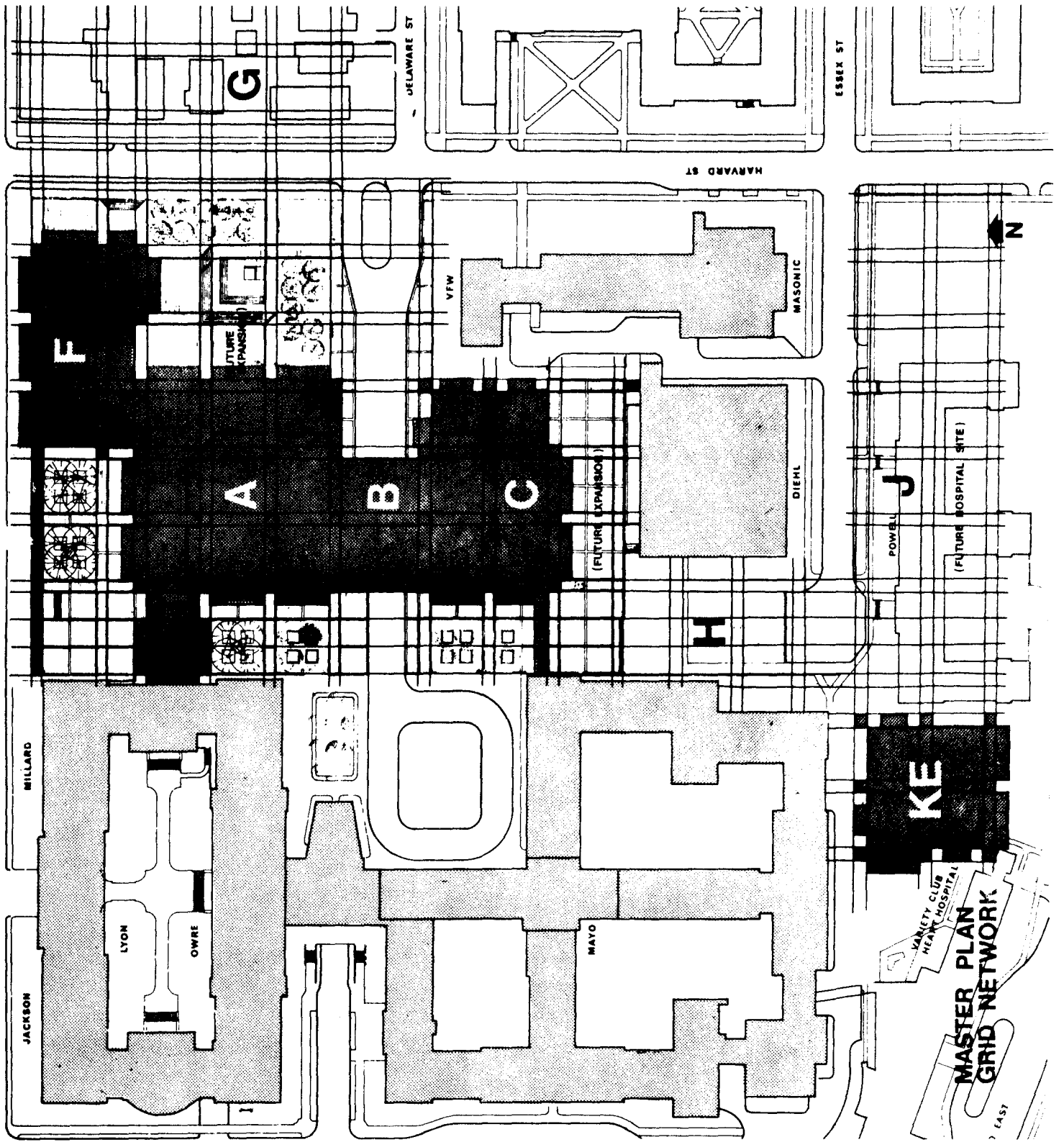
HARVARD

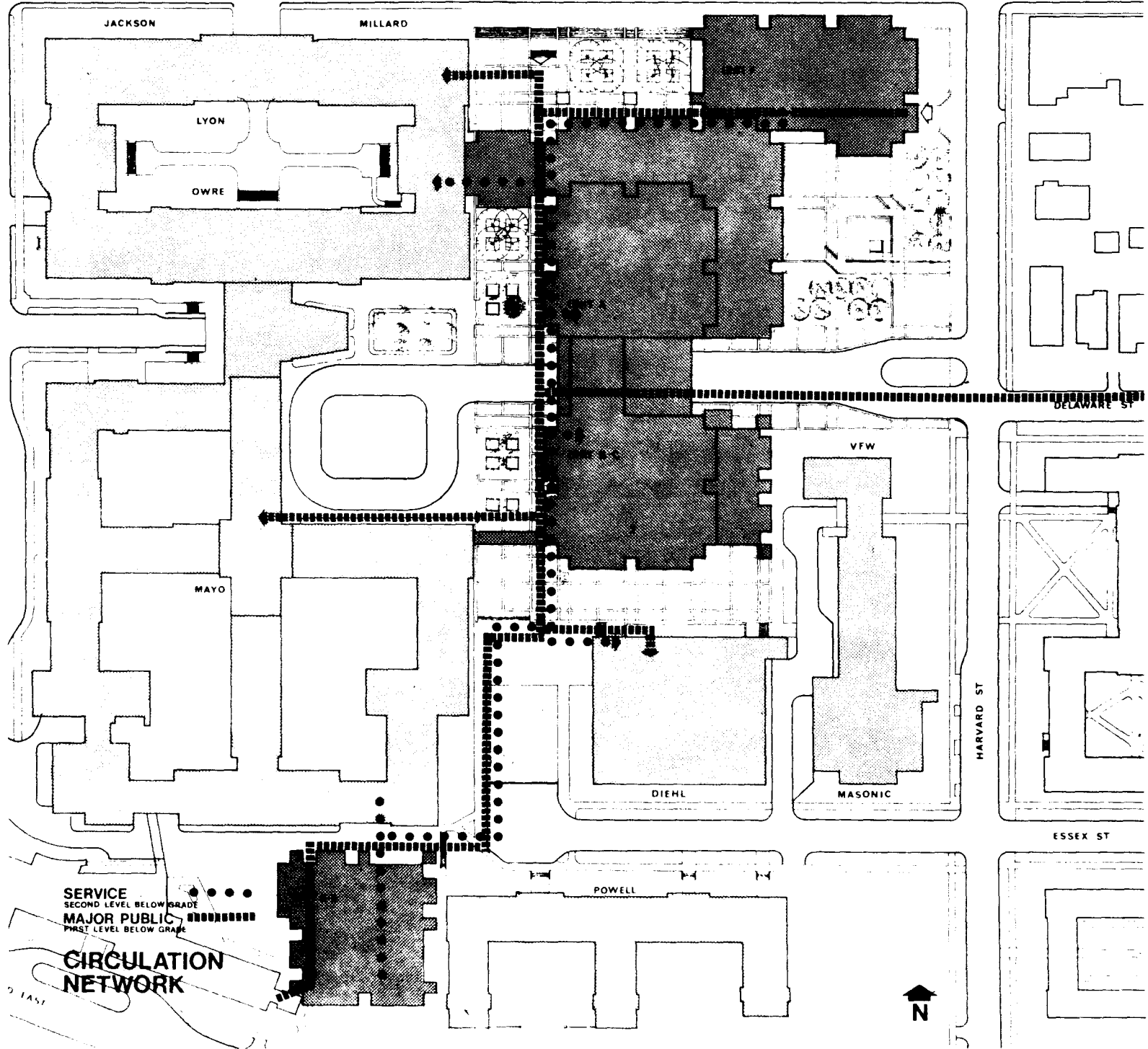
RIVER ROAD

LEGEND

- A** College of Dentistry
- BC** College of Medicine
- F** College of Pharmacy
- School of Nursing**
- KE** Central Receiving







V. Project Cost Estimate

Outline of the method used in preparing the construction budget entered on Item 18 of the HEW Form 537:

UNIT F APPLICATION New Construction	<u>\$\$ TOTAL</u>	<u>\$\$ ELIGIBLE FOR FEDERAL ASSISTANCE</u>
1. Building Costs and Fixed Equipment		
A. General Construction	9,141,530	
B. Plumbing	1,191,070	
C. Heat, Air Conditioning, Ventilation	2,392,730	
D. Electrical	1,422,400	
E. Elevators	315,940	
F. Other Building Work, Keying, Fire Alarms, etc.	<u>11,000</u>	
G. TOTAL FOR BUILDING WORK	14,474,670	14,474,670
2. Site Work		
A. Site Preparation	3,000	
B. Site Development (Landscaping and planing, grade, walks and drives)	165,000	
C. Utility Conn. (Sanitary Sewer, Water Conn., Storm Sewer, Gas Service)	<u>51,000</u>	
D. SUBTOTAL	219,000	133,508
3. ---		
4. Central Utility Plant		
A. Switchgear (Pro-Rata)		
<u>209,854 sfg X 208,821</u>		
1,621,263	27,009	
B. Control Center		
<u>209,854 sfg X 279,788</u>		
1,621,263	36,215	
C. Central Plant		
<u>17,120#/Hr. X 1,805,125</u>		
175,000#/Hr. (Phase I)	<u>176,593</u>	
D. SUBTOTAL	239,817	239,817

5. Total Construction	14,933,487	
6. Built-In Equipment	824,030	824,030
7. A. Architect and Engineer Fees		
7% X 15,287,700	1,070,139	
Redesign	60,000	
B. Supervision of Construction		
1 1/4% X 15,287,700	191,096	
C. Surveys and test borings	37,000	
D. Other items (e.g., Consultants, Printing, Travel, University of Minnesota Engineering Reviews, Miscellaneous Engineering)	60,000	
E. SUBTOTAL	1,418,235	871,235
8. Movable Equipment	2,293,155	2,293,155
9. Total Cost of Construction and Fixed Equipment, A/E Fees, and Movable Equipment	19,468,907	
10. Contingency		
3% X 15,287,700	458,631	458,631
11. Land Purchase (including apartment buildings)	1,021,400	---
TOTAL DEVELOPMENT COSTS FOR NEW CONSTRUCTION	20,948,938	19,295,046

The construction budget as entered in HEW Form 537 is a detailed breakdown based on completed schematic drawings and actual unit cost of the various subsystems as they were bid on Unit A. The successful systems cost format was developed by the Architects Collaborative, Inc., in collaboration with Hodges, Jage, Sullivan, and Aller Construction Consultants.

COST RATIOS:

Gross Area in Facility = 213,039 sq.ft.
Net Area in Facility = 111,584 sq.ft.

Gross Area (Pharmacy) = 213,039 X 50% = 106,519 (approx.) sq.ft.
Net Area (Pharmacy) = 56,384 sq.ft.

Total Project Cost = \$20,948,938

Total Project Cost (Pharmacy portion) = \$20,948,938 X 50%
= \$10,474,469

Cost/GSF (Pharmacy) = \$98
Cost/NSF (Pharmacy) = \$186

Total Construction Cost = \$14,933,487

Total Construction Cost (Pharmacy portion) = \$14,933,487 X 50%
= \$ 7,466,744

Cost/GSF (Pharmacy) = \$70
Cost/NSF (Pharmacy) = \$132

Amount of Federal Assistance Requested (Pharmacy) = \$4,823,761

Cost/GSF (Pharmacy) = \$45
Cost/NSF (Pharmacy) = \$86

Enrollment Increase (Pharmacy) = 49

Per student capital outlay of project costs (Pharmacy portion)
= \$213,765
Per student capital outlay of construction costs (Pharmacy portion)
= \$152,383
Per student cost of project to the Federal government (Pharmacy)
= \$ 98,444

VI. ENVIRONMENTAL IMPACT STATEMENT

Under separate cover.

Appendix A

- University of Minnesota
Bulletin 1973-75
GRADUATE PROGRAMS IN THE
HEALTH SCIENCES
(portion relating to
the College of Pharmacy)

- GRADUATE RESEARCH TRAINING
PHARMACEUTICAL SCIENCES
College of Pharmacy
University of Minnesota

M 8850f, w, s, su. PEDIATRIC ENDOCRINOLOGY

M 8860f, w, s, su. PEDIATRIC NEPHROLOGY

CHILD PSYCHIATRY. (See Psychiatry)

PEDIATRIC NEUROLOGY. Staff

RESEARCH IN PATHOLOGY, BIOCHEMISTRY, OR PHYSIOLOGY. (See these departments)

PHARMACEUTICS (Phm)

OFFERED AT MINNEAPOLIS

Professor

Edward G. Rippie, Ph.D., head,
director of graduate study,
pharmaceutics

Hugh F. Kabat, Ph.D., head,
department of Clinical Pharmacy,
and director of graduate study,
Hospital Pharmacy

Associate Professor

Robert H. Miller, Ph.D.
John D. McRae, Ph.D.

Assistant Professor

Kenneth W. Miller, Ph.D.
Kenneth G. Nelson, Ph.D.
Ronald J. Sawchuck, Ph.D.

Pharmaceutics is concerned with the elucidation, analysis, and means of control of the physical chemical properties of the drug and its dosage forms as they influence its availability to the site of action in the living organism. Such studies include the investigation of the functional relationships existing between tissue or body fluid concentrations of drugs or related compounds and the rates or mechanisms of their absorption, distribution, metabolism, excretion, and pharmacological activity. Thus the area is broad, offering specialization ranging from highly physical to strongly biological orientations.

Program in Hospital Pharmacy

Prerequisites—A degree from a college of pharmacy and an exceptional scholarship record. Evidence of personal capability and fitness for work in the hospital field is likewise necessary in each case and will be considered an essential requirement for admission.

Language Requirement—Students taking the degree under Plan B (without thesis) are not required to offer a language; those taking a Plan A degree (with thesis) must offer one.

Minor Fields—The choice of minor fields of study may vary considerably, depending on the research interest of the student. The selection of courses will be made after consultation with the student's adviser.

Master's Degree—Either Plan A or Plan B is acceptable.

Program in Pharmaceutics

Prerequisites—A degree from a college of pharmacy and an exceptional scholastic record. Consideration will also be given to applicants who are graduates of institutions other than colleges of pharmacy, provided their undergraduate courses satisfy the prerequisites for the graduate courses in pharmaceutics.

Fields of Instruction

The department presents a comprehensive program of course work and research offerings leading to the M.S. and Ph.D. degrees. A basic background in the physical and biological sciences is provided as a firm foundation for the study of modern pharmaceuticals. The broad scope of the program affords the student an exceptional opportunity to elect a course of study which best meets individual needs and interests. Minor fields which are particularly desirable include physical chemistry, chemical engineering, biochemistry, and pharmacology.

Language Requirement—For the Master's degree, either (a) one foreign language or (b) a collateral field of knowledge with the consent of the director of graduate study. For the Ph.D. degree, the option of (a) two foreign languages, (b) one foreign language and a collateral field of knowledge with the consent of the director of graduate study, or (c) two collateral fields of knowledge with the consent of the director of graduate study.

Minor—The choice of the particular courses to be presented in fulfillment of a minor in graduate work will be made after consultation with the student's adviser.

Master's Degree—Offered under both Plan A and Plan B.

Doctor's Degree—Work leading to the Ph.D. degree is offered.

- 5520.* **VETERINARY SCIENCE.** (3 cr; prereq Phs1 3070, Phcl 5102 or equiv)
(Same as VPP 5520) Specialization course. Professional interrelationships between pharmacists and veterinarians, disease problems of domestic animals, and animal pharmacology.
- 5670-5680. **BIOPHARMACEUTICS—DRUG INFORMATION EVALUATION.** (4 cr per qtr; prereq 5th-yr, 5640, Phcl 5102; 3 lect hrs, one 2-hr workshop per wk) K Miller, Sawchuck
Consideration of the processes of drug absorption, distribution, metabolism, and excretion *in vivo*. Statistical methods and procedures for critical evaluation of current literature dealing with those subjects.
- 5690.* **COSMETICS AND DERMATOLOGICAL PREPARATIONS.** (3 cr; prereq 5640) R Miller
Pharmaceutical aspects of cosmetics and dermatological preparations.
- 5692-5694.* **PHARMACEUTICAL MANUFACTURING.** (3-5 cr per qtr; prereq 5640, MedC 5490 or 2) R Miller
Production and control of pharmaceutical preparations on a pilot plant scale. Formula development and product stabilization.
- 5696.* **PREPARATION OF PARENTERAL PRODUCTS.** (3 cr; prereq 2) Nelson
Principles and procedures involved in manufacture of parenteral products.
- 5699.* **SPECIAL PROBLEMS IN PHARMACEUTICS.** (Cr ar; prereq 2) Staff
Problems in formulation, production, and evaluation of pharmaceutical products.
5700. **HOSPITAL PHARMACY ADMINISTRATION I.** (2 cr; prereq 2) Kabat
History, classification, organization, and functions of departments in a hospital in relation to pharmacy service.
5701. **HOSPITAL PHARMACY ADMINISTRATION II.** (3 cr; prereq 5700, 2) Kabat
Development, organization, responsibility, and administration of hospital pharmacy services.
5702. **HOSPITAL PHARMACY SURVEY.** (1 cr; prereq 5701, 2) Kabat
- 8100.* **SEMINAR: PHARMACEUTICS.** (1 cr; required of majors in pharmaceuticals) Staff
- 8200.* **RESEARCH PROBLEMS.** (Cr ar; prereq 2) Staff
Experimental investigation of problems in pharmaceuticals.

- 8300-8301. PHARMACEUTICAL DEVELOPMENT. (5 cr per qtr; prereq 5694 or 2; offered when demand warrants) R Miller
Theoretical and practical problems involved in new product development including F.D.A. regulations, new drug application procedures, patents, and production and control on a pilot plant scale.
- 8310-8311. EXTRACTION, DISTRIBUTION, AND PARTITION SYSTEMS. (3-5 cr per qtr; prereq 2; offered when demand warrants) R Miller
Theory and practice of extraction of liquids and solids, countercurrent distribution, solvent and solute effects, and chromatography.
- 8400-8401. ADVANCED ANALYTICAL METHODS. (3-5 cr per qtr; prereq MedC 5494, Chem 5503 or 2; offered when demand warrants) Rippie
Special procedures for control of foods, drugs, and cosmetics, e.g., sampling techniques and design of experiments for control of shelf-life, storage conditions, loss of potency, etc.
8410. STABILIZATION OF PHARMACEUTICALS. (3 cr; prereq Chem 5503) McRae
Application of physicochemical principles (e.g., chemical kinetics) to elucidate and minimize stability problems in pharmaceutical systems.
- 8420-8421.* PHARMACOKINETICS. (3 cr per qtr; prereq 5680, Math 1444 or 2; offered when demand warrants) K Miller, Sawchuk
Application of compartmental models to study of absorption, distribution, metabolism, and excretion of drugs. Introduction to and use of analog computer in determination of model parameters. Techniques of drug administration and biological fluid sampling in laboratory animals.
8430. DRUG TRANSPORT. (3 cr; prereq Chem 5503) Nelson
Theory of diffusional transport of drug molecules with applications to pharmaceutical dosage forms.

PHARMACOGNOSY (Phcg)

OFFERED AT MINNEAPOLIS

Professor

E. John Staba, Ph.D., chairman,
director of graduate study

Assistant Professor

Orval L. Mullen, Ph.D.

Associate Professor

Yusuf Abul-Hajj, Ph.D.

Prerequisites—A degree from an accredited college of pharmacy and a superior scholastic record. Consideration will also be given to applicants who are graduates of institutions other than colleges of pharmacy.

Language Requirement—For the Master's degree, one foreign language is advised but not required. For the Ph.D., the requirement may be met by either (a) two foreign languages, (b) a higher order of proficiency in one foreign language, or (c) one foreign language selected from French, German, Japanese, or Russian plus a collateral field of study or a special research technique.

5820. INTRODUCTORY PHARMACOGNOSY. (3 cr; prereq MicB 3103, MedC 5440 or 2)
Principles of immunology and allergy, pathogenic microorganisms, and treatment of disease states with immunizing biologicals.
5830. INTRODUCTORY PHARMACOGNOSY. (3 cr; prereq 5820 or 2)
Production, constituents, metabolism, and therapeutic uses of drugs containing antibiotics, amino acids, and enzymes.
5840. INTRODUCTORY PHARMACOGNOSY. (4 cr; prereq MedC 5440)
Production, constituents, metabolism, and therapeutic uses of drugs containing hormones, vitamins, and alkaloids.

Fields of Instruction

- 5860. ANTIBIOTICS.** (2 cr; prereq 5830 or §) Staba
Natural antibiotic substances. Methods of production, biosynthesis, extraction, and assay; chemical, pharmaceutical, and chemotherapeutic properties.
- 5870. VITAMINS AND HORMONES.** (2 cr; prereq 5840 or §) Abul-Hajj
Biosynthesis, chemistry, biochemical functions, mechanisms of actions, production, and uses.
- 5875. ANTIBIOTICS, VITAMINS, AND HORMONES LABORATORY.** (1 cr; prereq 5830, 5840 or §) Staff
Introduction to techniques used to produce, isolate, and observe biological effects of these substances.
- 5880. PHARMACEUTICAL IMMUNOLOGY.** (2 cr; prereq §) Mullen
- 5899. SPECIAL PROBLEMS IN PHARMACOGNOSY.** (Cr ar; prereq §) Staff
Microbiology, chemistry, or biology of medicinal natural products.
- 8100. MEDICINAL PRODUCT ISOLATION AND IDENTIFICATION.** (4 cr; prereq §; offered when feasible) Staff
Isolation and identification of a glycoside, pigment (flavonoid, tetracycline, etc.), and a heterocyclic compound (alkaloid, etc.) from either plants or animals.
- 8200. MEDICINAL PRODUCT ISOLATION AND IDENTIFICATION.** (4 cr; prereq §; offered when feasible) Staff
Isolation and identification of a triterpene or steroid, terpene (citral, geraniol, etc.), and a phenylpropide (coumarin, chlorogenic acid, etc.) from either plants or animals.
- 8300. PHARMACEUTICAL FERMENTATION TECHNIQUES.** (4 cr; prereq §)
Physical and nutritional factors involved in production and biotransformation of antibiotics, steroids, alkaloids, growth regulators, and other useful compounds by microorganisms, tissue cultures, and extracellular enzyme preparations.
- 8400. SELECTED TOPICS.** (3 cr on completion of 3 qtrs) Staff
- 8500. PHARMACOGNOSY SEMINAR.** (1 cr) Staff
- 8900x. RESEARCH IN PHARMACOGNOSY.** (Cr ar; prereq §) Staff

PHARMACOLOGY (Phcl)

OFFERED AT MINNEAPOLIS

Professor

Frederick E. Shideman, M.D., Ph.D., *head*
Akira E. Takemori, Ph.D.,
director of graduate study
Nelson D. Goldberg, Ph.D.
Norman O. Holte, D.D.S.
Xenia Machne, M.D.
Gilbert J. Mannering, Ph.D.
Jack W. Miller, Ph.D.
Bernard L. Mirkin, M.D., Ph.D.
Lawrence C. Weaver, Ph.D.
Wallace F. White, Ph.D.
Ben G. Zimmerman, Ph.D.

Associate Professor

Marion W. Anders, Ph.D.
Donald B. Hunninghake, M.D.
Sheldon B. Sparber, Ph.D.

Assistant Professor

James F. Cumming, M.D., Ph.D.
Earl W. Dunham, Ph.D.
Patrick E. Hanna, Ph.D.
Aloysius J. Quebbemann, Ph.D.
Norman E. Sladek, Ph.D.

Pharmacology is a broad science which considers the interactions between drugs and other chemicals and living organisms or life processes at all levels of organization. Facilities are available for most types of training and research in this field. For those primarily interested in toxicology or psychopharmacology, appropriate programs are provided. Excellent opportunities exist for cooperative clinical research through members of the staff who hold joint appointments in clinical departments of the Medical School and are members of the Division of Clinical Pharmacology of the Department of Pharmacology.

Graduate training in the field of pharmacology is usually oriented toward the Ph.D. degree. The M.S. degree is offered only under special circumstances.

Several graduate fellowships, research assistantships, teaching assistantships, or traineeships are usually available.

Prerequisites—In addition to fulfilling requirements for admission to the Graduate School, students should be well-grounded in the biological and physical sciences.

Major—For a major the student is required to complete pharmacology courses 8203 through 8205, 8211 and 8212, and any three other advanced major courses (Phcl 8206, 8208, 8209 or 8214 through 8218). Prerequisite courses include physiology and biochemistry. Additional requirements are courses in histology, statistics, calculus, microbiology, and such others as may be indicated by the major adviser.

Minor—To meet the requirements for a minor in pharmacology, the student must satisfactorily complete course work representing 22 credits. These courses must include Phcl 8205, 8211, and 8212 and no more than 8 credits of seminar, of which at least 3 credits shall be Phcl 8204.

Language Requirement—For the Master's degree, no foreign language is required. For the Ph.D. degree, either (a) one foreign language or (b) an additional program of course work approved by the department. Routinely acceptable languages for the Ph.D. degree are French, German, Italian, Russian, and Spanish.

Master's Degree—Offered only under Plan A.

Doctor's Degree—Work leading to the Ph.D. degree is offered.

- 8203. RESEARCH IN PHARMACOLOGY. (Cr and hrs ar; prereq §) Shideman and staff
- 8204. SEMINAR: SELECTED TOPICS IN PHARMACOLOGY. (3 cr on completion of 3 qtrs; prereq 5102 or §) Quebbemann, Hanna, and staff
- 8205. INTRODUCTION TO PHARMACOLOGY. (5 cr; prereq MdBe 5101 or equiv, Phsl 8110 or equiv or §) Miller and staff
Lectures on principal pharmacologic effects of major classes of drugs. General principles and mechanisms of action emphasized.
- 8206. SEMINAR: MICROASSAY OF DRUGS. (1 cr; prereq Chem 3101 or §; offered 1973-74 and alt yrs) Holtzman and staff
Review of analytical methods for identification and quantitation of drugs in body fluids, with emphasis on instrument and radiometric technics. Basic principles, applications, and limits of each method discussed. Demonstrations.
- 8207. SEMINAR: PSYCHOPHARMACOLOGY. (3 cr on completion of 3 qtrs; prereq §) Sparber and staff
Selected topics on behavioral aspects of drug action.
- 8208. PSYCHOPHARMACOLOGY. (2 cr; prereq 8205, Psy 5018, Psy 5062 or §; offered 1974-75 and alt yrs) Sparber and staff
Lectures on methodologies currently in use to study relationships between drugs and biochemical and behavioral consequences. Included will be discussions of functional biogenic amine pathways and how specific manipulations result in altered behavior; theories of biochemical feedback activation, induction and inhibition, and theories of tolerance to and/or dependence upon stimulants, hallucinogens, depressants, and opiates.
- 8209. PHYSIOCHEMICAL CONCEPTS OF DRUG ACTION. (2 cr; prereq 8205 or equiv or §; offered 1973-74 and alt yrs) Hanna and staff
Lectures, discussion periods, and outside reading assignments on fundamental principles of chemical-biological interactions with emphasis on molecular mechanisms of drug action.

Fields of Instruction

8211. **PHYSIOLOGICAL DISPOSITION OF DRUGS.** (3 cr; prereq MdBc 5101 or equiv or §; offered 1973-74 and alt yrs) Mannering and staff
Principles underlying absorption, distribution, biotransformation, and excretion of drugs.
8212. **PHARMACODYNAMICS.** (3 cr; prereq 8203 or §) Takemori and staff
Lectures and laboratory experiments for studying physiological, biochemical, and behavioral effects of drugs.
8214. **TOXICOLOGY.** (3 cr; prereq 8205 or equiv or §; offered 1973-74 and alt yrs) Anders and staff
Lectures on toxic effects and mechanisms of intoxication of drugs and foreign chemicals known to adversely alter the health and ecology of man and animals.
8215. **CHEMOTHERAPY.** (2 cr; prereq 8205 or equiv, MdBc 5101 or equiv, MicB 5105 or equiv or §; offered 1974-75 and alt yrs) Sladek and staff
General principles of antimicrobial and antineoplastic chemotherapy with emphasis on mechanisms of action and bases for selective toxicity. Course consists of lectures, outside reading, discussion periods, and demonstrations.
8216. **ENDOCRINE PHARMACOLOGY.** (2 cr; prereq 8205, MdBc 5101 or equiv, Phl 8110 or equiv or §; offered 1974-75 and alt yrs) Goldberg and staff
Lectures on biochemical and molecular aspects of hormone and neurohormone actions, including mechanism by which pharmacological agents influence these actions. Emphasis placed on pharmacological and biochemical characteristics of plasma membrane receptors, as well as intracellular components involved in expression of hormone actions.
8217. **CARDIOVASCULAR-RENAL PHARMACOLOGY.** (2 cr; prereq 8205 or equiv or §; offered 1974-75 and alt yrs) Zimmerman and staff
Physiological regulation of and pharmacological effects on cardiovascular and renal systems. Neurohumoral modification of cardiac function, peripheral and renal vascular resistance, hypertension, antihypertensive agents, and active transport mechanisms in the kidney.
8218. **NEUROPHARMACOLOGY: BIOPHYSICAL ASPECTS.** (2 cr; prereq §; offered 1974-75 and alt yrs) Machne and staff
Lectures on mechanism of action of drugs on excitable membranes and postsynaptic membrane receptors. Discussion of electrophysiological methods used to evaluate drug action at cellular level and on a population of neurons.
8219. **BEHAVIORAL PHARMACOLOGY.** (3 cr; prereq 8205 and Psy 5017 or §) Pickens and staff
Behavioral effects of drugs.

PHARMACOLOGY

OFFERED AT ROCHESTER

Professor

John R. Blinks, M.D., *chairman*
Frank T. Maher, M.D., Ph.D.

Assistant Professor

William S. Brimijoin, Ph.D.
Joseph H. Szurzewski, Ph.D.
Stuart R. Taylor, Ph.D.
Richard Weinshilboum, M.D.

Research programs for the Ph.D. degree may be developed with members of the faculty and will usually involve course work on the Minneapolis Campus.

- M 5100, 5101, and 5102. **GENERAL PHARMACOLOGY.** (3 cr per qtr) Blinks and staff
- M 8200. **READINGS IN PHARMACOLOGY.** (Cr and hrs ar) Staff
- M 8201. **RESEARCH IN PHARMACOLOGY.** (Cr and hrs ar) Staff
- M 8202. **PHARMACOLOGY OF HEART MUSCLE.** (1½ cr) Blinks
- M 8203. **NEUROPHARMACOLOGY.** (1½ cr) Weinshilboum, Brimijoin
- M 8880. **SEMINARS IN NERVE AND MUSCLE.** (1½ cr) Szurzewski and staff

Fields of Instruction

- 8400. SPECIAL CLINICAL PROBLEMS.** (Cr ar) Staff
Opportunities for study of medication errors, drug distribution systems, patterns of drug utilization, cost benefit analysis of prescribed medication according to diagnosis, age, dosage form, effectiveness, side effects, incidence of adverse effects, or drug use and misuse.
- 8500, 8501. PHARMACY AND ITS ENVIRONMENT.** (3 cr per qtr; prereq §; offered 1973-74 and alt yrs) Kabat
Cultural foundations of pharmacy. Development of present state of pharmacy practice. Social-psychological factors in drug use, abuse, or nonuse by the patient and practitioner. Role of pharmacist as health practitioner: within the profession, in relation to other health practitioners, and in relation to the general public.
- 8700. HOSPITAL PHARMACY ADMINISTRATION I.** (2 cr) Jones
History, classification, organization, and functions of hospital departments in relation to the pharmacy service.
- 8701. HOSPITAL PHARMACY ADMINISTRATION II.** (3 cr; prereq 8700, §) Grogan
- 8702. HOSPITAL PHARMACY SURVEY.** (1 cr; prereq 8701, §) Kabat

PHYSICAL MEDICINE AND REHABILITATION (PMed)

OFFERED AT MINNEAPOLIS

Professor

Frederic J. Kottke, M.D., Ph.D., head
Essam A. Awad, M.D., Ph.D.,
director of graduate study
Peter F. Briggs, Ph.D.
Glenn Gullickson, Jr., M.D., Ph.D.
William G. Kubicek, Ph.D.

Clinical Professor

Paul M. Ellwood, Jr., M.D.
Miland E. Knapp, M.D., M.S.

Associate Professor

Thomas Anderson, M.D., M.S.
Gary T. Athelstan, Ph.D.
Theodore Cole, M.D.
Daniel Halpern, M.D.
Pearl Rosenberg, Ph.D.

Physical Therapy

Professor

Glenn Gullickson, Jr., M.D., Ph.D.
Frederic J. Kottke, M.D., Ph.D.
William G. Kubicek, Ph.D.

Theodore M. Cole, M.D.
Martin O. Mundale, M.S.
James F. Pohitilla, M.S.
Pearl P. Rosenberg, Ph.D.

Associate Professor

Wilbur L. Moen, B.A., B.S., director
Helen V. Skowlund, M.S.,
director of graduate study
John D. Allison, M.S.
Thomas P. Anderson, M.D.
Gary T. Athelstan, Ph.D.

Assistant Professor

Jessie K. M. Easton, M.D.
Mary A. Price, M.D.

Instructor

Donna L. Pauley, B.S.

The field of physical medicine and rehabilitation, which includes physical therapy, occupational therapy, vocational counseling, guidance, and training of the physically handicapped, is one of the most rapidly expanding specialties in medicine. Trained physiatrists, of whom there are an insufficient number, are in great demand in medical schools, private practice, Veterans Administration hospitals, and many state hospitals for the chronically disabled. Physical medicine, therefore, offers unusual opportunity to the young physician.

Opportunity for clinical and fundamental research, as well as clinical experience and training, is offered at University of Minnesota Hospitals. Additional clinical experience is obtained at Hennepin County General Hospital, Minne-

GRADUATE RESEARCH TRAINING

Graduate programs are available in the following pharmaceutical areas:

Hospital Pharmacy
Medicinal Chemistry
Pharmaceutics
Pharmacognosy
Pharmacy Administration

The graduate program is designed to provide a rounded experience by appropriate coursework, seminars, and special lectures supporting a continuing, individualized research program.

EMPLOYMENT OPPORTUNITIES:

A large spectrum of employment opportunities awaits the successful Ph.D. candidate in such diversified areas as university teaching and research, industrial research, private and governmental institutional research, governmental agencies, association work, etc. In some areas there is a decided shortage.

RESEARCH:

Each student conducts original research under the supervision of a staff member who is selected by the student within one year of his matriculation. Such research is directed toward the development of the M.S. or Ph.D. thesis and is of central importance in the training of the candidate.

ADMISSION REQUIREMENTS:

Candidates for graduate study in the Pharmaceutical Sciences should possess a Bachelor's degree in some science field such as pharmacy (required for Hospital Pharmacy), chemistry, biology, pre-medical study, etc. Ordinarily, a background including elementary coursework in organic chemistry, biochemistry, biology, physiology, microbiology, pharmacology and physical chemistry is desirable for admission to the laboratory oriented areas although a Bachelor's degree in the social sciences may be an asset in Pharmacy Administration. Deficiencies in these areas may be removed by remedial course work early in the candidate's graduate tenure.

FINANCIAL ASSISTANCE:

Qualified candidates for study in the Pharmaceutical Sciences ordinarily can expect to have some type of subsidy. Normally, these will be in the form of teaching assistantships, research assistantships or predoctoral fellowships. The annual stipend for subsidized students ranges up to \$4,750 for nine months.

HOSPITAL PHARMACY

Hospital Pharmacy concerns itself with the practice of the profession of pharmacy in the institutional setting including those special services, activities and programs which are unique to that environment.

GRADUATE PROGRAM IN HOSPITAL PHARMACY

The program of graduate studies in Hospital Pharmacy is established in the College of Pharmacy but draws upon the resources of the total university for coursework opportunities. A basic core of subjects pertaining to the practice of pharmacy in hospitals is required with additional courses being available to meet the needs and strengths of the individual student. This comprehensive program of coursework and research leads to the M.S. degree in Hospital Pharmacy.

The following lists some of the interests and publications of the faculty of the program.

Hospital Pharmacy Administration - Charles M. King, Jr., Assistant Professor, Director of Graduate Studies in Hospital Pharmacy

The planning for and administration of pharmacy services in institutions, drug distribution systems, drug information programs, use of computer technology in providing pharmaceutical services, control mechanisms, management and administrative techniques, drug utilization review, education and training, drug use control, and extension of the role of the pharmacist.

Selected Publications

"Drug Information Services: Two Operational Models," C. M. King, (with V. F. Thudium), U.S. Government Printing Office, 1972.

"A Documented Cross-Indexed Manual to Human Drug Interactions," C. M. King, (with N. J. Sawyer and B. A. Hellums), A.J.H.P., 27:12 (Dec. 7) 1970.

"A Course in Clinical Pharmacy in Alabama," C. M. King, (with T. N. Burell), Alabama Journal of Pharmacy, (June) 1970.

"A Course in Administrative Principles for Hospital Pharmacists," C. M. King (with H. L. Flack), A.J.H.P., 21:9 (Sept.) 1964.

Hospital Pharmacy - Dr. Hugh F. Kabat, Professor

Patient compliance studies; job satisfaction studies; drug distribution studies; long term care facility drug distribution; patient consultation studies; drug utilization review studies; role definition of extended roles for pharmacists and drug induced modification of laboratory test values.

Selected Publications

"Drug Utilization Review in Long Term Care Facilities," H. F. Kabat, (with J. Stewart and J. Marttila) J.A.Ph.A., NS15:1 (Jan.) 1975.

"Drug-Induced Modifications of Laboratory Test Values - Revised 1973," H. F. Kabat, (with N. V. Constantino) Amer. J. Hosp. Pharm., 30:24-71 (Jan.) 1973.

"Job Satisfaction Among Minnesota Hospital Pharmacists," H. F. Kabat, (with R. E. Williamson), Amer. J. Hosp. Pharm., 29:942-946 (Nov.) 1972.

"Allocating Hospital Pharmacy Resources," H. F. Kabat, (with R. J. Streit), Hosp. Pharm., 10:338-347 (Oct.) 1972.

Pharmacy Administration - Albert I. Wertheimer, Associate Professor and Head, Director of Graduate Studies in Pharmacy Administration

Socioeconomics of health care delivery and evaluation of pharmaceutical services.

Selected Publications

"The Effect of Hospital Formularies on the Prescribing of Drugs in Private Practice," A. I. Wertheimer (with B. Rowles and B. Bunting), Hospital Pharmacy, 8, No. 8, 254 (Aug.) 1973.

"Nurses' Attitudes Toward Pharmaceutical Services," A. I. Wertheimer, (with P. R. Grout), Hospital Formulary Management, 8, No. 3, 18 (Mar.) 1973.

"More on the Pharmacist as a Drug Consultant: Three Case Studies," A. I. Wertheimer, (with E. Shefter and R. Cooper), Drug Intelligence and Clinical Pharmacy, 7, No. 2, 58-61 (Feb.) 1973.

"A Decentralized Unit Dose Pharmacy Service: Asset or Liability?", A. I. Wertheimer, (with D. Yorlo, R. Myers, L. Chan and R. Hutchinson, A.J.H.P., 29, No. 11, 922-927 (Nov.) 1972.

"A Community Formulary?" A. I. Wertheimer, (with R. V. Evanson), JAPhA, NS11, 10, 549 (Oct.) 1971.

"A Leased Hospital Pharmacy-Why Not?", A. I. Wertheimer, Hospital Pharmacy, 5:10, 3 (Oct.) 1970.

Hospital Pharmacy Administration - Thomas F. Jones, Assistant Professor

Health systems planning, marketing of health care, primary care development, clinical role development of pharmacist.

Selected Publications

"Pharmacy and the Hospital," T. F. Jones, Minnesota Pharmacist, 25:6 (1970).

"Clinical Pharmacist: A Guide to Successful Course Implementation." T. F. Jones, Hospitals, 43:100, 1969.

Hospital Pharmacy - James E. Grogan, Adjunct Assistant Professor

Development of the service aspect of pharmacy practice, training of hospital pharmacy managers, development and upward mobility of technicians and the utilization of pharmacist skills in patient care.

Selected Publications

"The Social and Economic Costs of Ileitis and Colitis," J. E. Grogan, (with M. C. Smith), The Apothecary, (In Press).

"The Four-forty Work Week for the Hospital Pharmacy: A Discussion and Decision Guide," J. E. Grogan, (with A. L. Gurtel), Am. J. Hosp. Pharm. No. 5, Vol. 31 (May) 1974.

"The National Cost of Ulcerative Colitis: A National Estimate for the Year 1968," J. E. Grogan, (with M. C. Smith), Inquiry, No. 2, 10:61, (June) 1973.

"What Ulcerative Colitis Patients Know and Think about Their Drugs," J. E. Grogan, (with M. C. Smith), Pharmacy Times, (Feb.) 1973.

"Three Months of Observations in Rural Pharmacies: Opportunities for Professional Consultation," J. E. Grogan, (with M. C. Smith, and I. W. Waters), J.A.Ph.A., No. 2, NS11:64 (Feb.) 1971.

MEDICINAL CHEMISTRY

Medicinal Chemistry is concerned with studies of the chemistry of substances designed to meet a specific physiological need. Such studies involve the synthesis, or isolation from natural sources, of such substances together with suitable purification, characterization, structural elucidation, structural modification and other chemical and biochemical studies necessary for an understanding of the relationship of molecular structure with biological activity and realization of maximal specific activity.

GRADUATE PROGRAM IN MEDICINAL CHEMISTRY

The Medicinal Chemistry Department at the College of Pharmacy, University of Minnesota, presents a comprehensive program of coursework and research offerings leading to the M.S. and Ph.D. degrees. The program provides a background in modern medicinal chemistry and is characterized by having a strong biological component superimposed on a firm foundation in organic chemistry. The program has sufficient flexibility to permit designing a course of study to meet the needs and interests of the individual student. In addition to coursework offerings within the Medicinal Chemistry Department the student will also be engaged in interdisciplinary studies in other University departments such as organic chemistry, biochemistry, and pharmacology.

Specific research interests of faculty members in this department are listed below:

Drug metabolism and antimetabolites -- Dr. Mahmoud M. Abdel-Monem, Associate Professor

Studies encompass the identification of drug metabolites in vivo and in vitro and the examination of the biochemical mechanisms of drug biotransformations. Studies in the area of amino acid antimetabolites are also carried out in an attempt to elucidate the physiological function of the polyamines.

Selected Publications

"Separation of the Dansyl Derivatives of Polyamines and Related Compounds by Thin Layer Chromatography and High Pressure Liquid Chromatography," M. M. Abdel-Monem, (with K. Ohno), J. Chromatography in press (1975).

"Inhibitors of Polyamine Biosynthesis. 2- α -Alkyl- and Benzyl-(I)-Ornithine," M. M. Abdel-Monem, (with N. E. Newton and B. C. Ho), J. Med. Chem., in press (1975).

"Inhibitors of Polyamine Biosynthesis. 1- α -Methyl (+)-Ornithine, an Inhibitor of Ornithine Decarboxylase, M. M. Abdel-Monem, (with N. E. Newton and C. E. Weeks), J. of Med. Chem., 17, 447 (1974).

"Acid-Labile Derivatives of Chloramphenicol as Potential Latentiation Forms," M. M. Abdel-Monem, (with A. D. Gillet), J. Med. Chem., 16:992 (1973).

"Pharmacokinetics, Metabolism and Urinary Excretion of [³H]Alphaprodine in Dogs, M. M. Abdel-Monem, (with P. A. Harris and P. S. Portoghesi) J. Med. Chem., 15:706 (1972).

Medicinal Chemistry - Dr. Dwight S. Fullerton, Assistant Professor

Structure-Activity Studies of Digitalis Receptors; Design of Nontoxic Cardenolides; Biologically Active Sesquiterpenes; Development of Useful Synthetic Reactions; Forensic Drug Analysis

Selected Publications

"22-Methylene Cardenolides," D. S. Fullerton, (with T. M. Gilman) presented August, 1974 at the Academy of Pharmaceutical Sciences Meeting, Chicago; To be published in J. Pharmaceutical Sciences.

"Reactions of Interest In Medicinal Chemistry," D. S. Fullerton (with G. L. Kenyon and D. H. Eargle), Annual Reports in Medicinal Chemistry, 9:260 (1973).

"A Critical Evaluation of Forensic Analysis," D. S. Fullerton (with M. G. Kurzman), J. Contemporary Drug Problems, in press (Fall, 1974 issue)

"Steroids with Abnormal Internal Configurations: A Stereospecific Synthesis of 8 α -Methyl Steroids," D. S. Fullerton (with W. G. Dauben), J. Org. Chem., 36:3277 (1971).

"Allylic Oxidation of Olefins with Chromium Trioxide-Pyridine Complex," D. S. Fullerton (with W. G. Dauben and M. Lorber), J. Org. Chem., 34:3587 (1971).

Medicinal Chemistry - Dr. Patrick E. Hanna, Associate Professor

Most drugs and other chemicals to which man and animals are exposed are metabolized prior to excretion from the body. The types of metabolic transformations which a substance undergoes and the rates at which these biotransformations occur often have a profound influence upon the effect a given compound has on the body.

Current research projects are directed toward development of an understanding of the ways in which the molecular properties of drugs and other foreign compounds influence specific biotransformation reactions. This research includes study of the metabolic activation of cancer producing chemicals.

Other research involves investigations of the stereochemical aspects of drug-receptor interactions. Conformationally restricted compounds are being used to study the interactions between drugs and histamine receptors as well as between drugs and histamine metabolizing enzymes.

Selected Publications

"Conformationally Restricted Analogs of Histamine H₁ Receptor Antagonists. 2-Phenyl- and 2-Benzyl-1,2,3,4-Tetrahydro-4-Dimethylaminoisoquinoline," P. E. Hanna (with V. R. Grund and M. W. Anders), J. Med. Chem., 17:1020 (1974).

"Inhibition and Potentiation by trans- and cis-1,5-Diphenyl-3-dimethylaminopyrrolidine," P. E. Hanna, (with R. T. Borchardt), J. Med. Chem., 17:471 (1974).

"3-Amino-5-Phenyl-1-(2-pyridyl)pyrrolidines: Synthesis and Stereochemistry," P. E. Hanna, J. Heterocycl. Chem., 10:747 (1973).

"Conformationally Restricted Analogs of Histamine H₁ Receptor Antagonists. trans- and cis-1,5-Diphenyl-3-dimethylaminopyrrolidine," P. E. Hanna (with A. E. Ahmed), J. Med. Chem., 16:963 (1973).

"1,5-Diphenyl-3-dimethylaminopyrrolidine: A Long-Acting Histamine Antagonist," P. E. Hanna, (with A. E. Ahmed, V. R. Grund and R. L. Merriman), J. Pharm. Sci., 62:512 (1973).

Medicinal Chemistry - Dr. Herbert T. Nagasawa, Professor

Syntheses of amino acid analogs, homologs and analogs of homologs, with antimetabolic or chemotherapeutic potential, using biochemical rationale as basis for their design. Presently, attention is being focused on the synthesis of proline and lysine analogs that are potential inhibitors of collagen biosynthesis, wherein blocking groups are placed in positions of enzymatic hydroxylation of these amino acids. Possibilities are also being explored for the synthesis of a wide variety of other proline, ornithine, lysine, citrulline and arginine analogs and homologs.

The metabolic bases for the action of certain drugs are being investigated by studying their biochemical transformations and metabolic disposition in animals with the aid of the radiolabeled drugs. Current focus is on ethanol metabolism and its influence on the metabolism of other drugs. Parallel interest lies in the design, synthesis and biochemical and pharmacological evaluation of drugs latentiated by enzyme action.

Selected Publications

"The Determination of Theophylline and Its Metabolites in Human Urine and Serum by High-pressure Liquid Chromatography," H. T. Nagasawa (with R. D. Thompson and J. W. Jenne), J. Lab. Clin. Med., 84:584-593 (1973)

"The Mechanism of Alkylation of DNA by 5-(3-methyl-1-triazeno)imidazole-4-carboxamide (MIC), a Metabolite of DIC (NSC-45388). Non-involvement of Diazomethane." H. T. Nagasawa (with F. N. Shirtota and N. S. Mizuno), Chem.-Biol. Interactions, 8:403-413 (1973).

"Acetaldehyde Metabolism by the Rat Heart," H. T. Nagasawa, (with G. W. Forsyth and C. S. Alexander), Proc. Soc. Exp. Biol. Med., 144:498-500 (1973).

"2-Aminoadamantane-2-carboxylic Acid, a Rigid, Achiral, Tricyclic α -Amino Acid with Transport Inhibitory Properties," H. T. Nagasawa, (with J. A. Elberling and F. N. Shirota), J. Med. Chem., 16:823-826 (1973).

"A New Method for Nitrosation of Proline and Related Secondary- α -amino Acids to N-Nitrosamino Acids with Possible Oncogenic Activity," H. T. Nagasawa, (with P. S. Fraser and D. L. Yuzon), J. Med. Chem., 16:583-585 (1973).

Medicinal Chemistry - Dr. Philip S. Portoghese, Professor and Head,
Director of Graduate Studies in Medicinal Chemistry

Stereochemistry and conformational analysis of biologically active compounds. Investigation of the relationship between stereochemistry and activity. Design and synthesis of new medicinal agents. Biophysical and biochemical investigation of receptor mechanisms. Metabolism and distribution studies. Inhibitors of prostaglandin biosynthesis.

Selected Publications

"Potential Nonequilibrium Analgetic Receptor Inactivators. Further Pharmacologic Studies of N-Acylanileridines," P. S. Portoghese, (with A. E. Takemori, A. Ward and V. G. Telang) J. Med. Chem., 17:1051 (1974).

"Stereochemical Studies on Medicinal Agents. 18. Absolute Configuration and Analgetic Potency of Trimeperidine Enantiomers," P. S. Portoghese, (with D. Fries), J. Med. Chem., 17:129 (1974).

"Stereochemical Studies on Medicinal Agents. 11. Metabolism and Distribution of Proline Isomers in Mice," P. S. Portoghese, (with M. M. Abdel-Monem, D. L. Larson and H. J. Kupferberg), J. Med. Chem., 15:494 (1972).

"Stereochemical Studies on Medicinal Agents. 15. The Absolute Configurations of Enantiomeric Diastereomers of 3-Allyl-1-Methyl-4-phenyl-4-propionyloxy-piperidine," P. S. Portoghese, (with K. H. Bell), J. Med. Chem. 16:589 (1973).

"Stereochemical Studies on Medicinal Agents. 10. The Role of Chirality in α -Adrenergic Receptor Blockade by (+) and (-)-Phenoxybenzamine Hydrochloride," P. S. Portoghese, (with T. N. Riley and J. W. Miller), J. Med. Chem. 14:561 (1971).

Medicinal Chemistry - Dr. Taito O. Soine, Professor and Assistant Dean,
Graduate Studies and Research

Studies involving isolation, purification, structure elucidation and synthesis of a variety of natural products are being carried out for the purpose of obtaining leads toward potentially useful biologically active agents. Studies have involved mainly alkaloids and naturally-occurring coumarins. Structure-activity relationships of active compounds are explored by means of suitable synthetic congeners.

Selected Publications

"Preparation and Curarimimetic Activity of (+)-Isotubocurarine," T. O. Soine, (with J. Naghaway), J. Pharm. Sci., 63:1643 (1974).

"Natural Coumarins VII. Isolation and Constitution of a New Coumarin, Peuruthenicin, from Peucedanum ruthenicum M. B.," T. O. Soine (with A. Zheleva, M. M. Mahandru, P. Erhardt and L. Bubeva-Ivanova), J. Pharm. Sci., 62:1897 (1973).

"Coumarins XII. Synthesis of (\pm)-Cis- and Trans-3',4'-dihydroxy-3',4'-dihydroxanthyletin and Some of Their Diesters," T. O. Soine, (with S. M. El-Antably), J. Pharm. Sci., 62:1643 (1973).

"Natural Coumarins V. Isolation of Xanthalin and a New Pyranocoumarin, Peuarenine, from Peucedanum arenarium W. K.," T. O. Soine, (with A. Zheleva and L. Bubeva-Ivanova), J. Pharm. Sci., 61:1643 (1972).

"Synthesis and Certain NMR Spectral Characteristics of Bisnorargemonine Isomers," T. O. Soine, (with C. H. Chen), J. Pharm. Sci., 61:55 (1972).

Medicinal Chemistry - Dr. Robert Vince, Associate Professor

Design, synthesis, and biological evaluation of antitumor agents; mechanism of action of antibiotics. Inhibitors of protein synthesis.

Selected Publications

"Puromycin Analogs. Ribosomal Binding and Peptidyl Transferase Substrate Activity of a Carbocyclic Analog of 8-Azapuromycin," R. Vince, (with P. Duquette and C. Ritter), Biochem., 13:4855 (1974).

"The Formation of Arabino Nucleosides from 3-Acetamido-1,2-di-O-Acetyl-3,5-Dideoxy-D-Ribofuranose during the Fusion Synthesis," R. Vince, (with R. Almquist), Carb. Res., 36:214 (1974).

"Puromycin Analogs. Studies on Ribosomal Binding with Diastereomeric Carbocyclic Puromycin Analogs," R. Vince (with S. Daluge), J. Med. Chem., 17:578 (1974).

"Puromycin Analogs. The Synthesis and Biological Activity of 5'-Deoxypuromycin and its Aminonucleoside," R. Vince (with R. Almquist), J. Med. Chem., 16:1396 (1973).

"Glutaryl-S-(p-bromobenzyl)-L-cysteinylglycine. A Metabolically Stable Inhibitor of Glyoxalase I," R. Vince, (with M. Wolf, and C. Sanford), J. Med. Chem., 16:951 (1973).

PHARMACEUTICS

Pharmaceutics is concerned with the elucidation, analysis, and means of control of the physical chemical properties of the drug and its dosage forms as they influence its availability to the site of action in the living organism. Such studies include the investigation of the functional relationships existing between tissue or body fluid concentrations of drugs or related compounds and the rates or mechanisms of their absorption, distribution, metabolism, excretion, and pharmacological activity. Thus the area is broad, offering specialization ranging from highly physical to strongly biological orientations.

GRADUATE PROGRAM IN PHARMACEUTICS

The Pharmaceutics Department at the College of Pharmacy, University of Minnesota, presents a comprehensive program of coursework and research offerings leading to the M.S. and Ph.D. degrees. A basic background in the physical and biological sciences is provided as a firm foundation for the study of modern pharmaceutics. The broad scope of the program affords the student an exceptional opportunity to elect a course of study which best meets his individual needs and interests. Minor fields which are particularly desirable include physical chemistry, chemical engineering, biochemistry, and pharmacology.

Specific research interests of faculty members in this department are listed below:

Pharmaceutics - Dr. Edward G. Rippie, Professor and Head, Director of Graduate Studies in Pharmaceutics

Current research includes investigations regarding the mechanics and mechanisms of the segregation or demixing phenomena observed in systems of particulate solids. These studies include the experimental determination of relative and absolute rates of mixing and segregation in multiparticulate systems subjected to vibration or shear, as well as the theoretical interpretation of the observations.

Research interests also include the chemical activity and reactivity of molecules within anisotropic liquid systems. Such systems are under study with regard to the thermodynamic and steric contribution of the

solvent to the observed solute behavior.

Selected Publications

"Nematic-Isotropic Solution Thermodynamics in Di(p-methoxyphenyl)-trans-cyclohexane-1,4-dicarboxylate," E. G. Rippie (with H. G. Ibrahim), accepted for publication in *Thermochimica Acta*.

"Esters of Bicyclic Aminoalcohols V: Duration of Corneal Anesthesia vs. Enzymatic Hydrolytic Rate of Benzoates of 1-, 2-, and 3-Methyl-2-hydroxyquinolizidines," E. G. Rippie (with M. A. Zoglio and T. O. Soine) *J. Pharm. Sci.*, 60:411 (1970).

"Hydrolysis of Procaine and Its Quaternary Derivatives within Lyotropic Smectic Mesophases," E. G. Rippie, (with K. S. Murthy), *J. Pharm. Sci.*, 59:459 (1970).

"Regulation of Dissolution Rate by Pellet Geometry," E. G. Rippie (with J. R. Johnson), *J. Pharm. Sci.* 58:428 (1969).

"Segregation Kinetics of Particulate Solids Systems IV. Effect of Particle Shape on Energy Requirements," E. G. Rippie, (with M. D. Faiman and M. K. Pramoda) *J. Pharm. Sci.*, 56:1523 (1967).

Physical and Chemical Stabilization of Pharmaceutical Systems - Dr. John D. McRae, Associate Professor

The systematic examination of pharmaceutical systems of interest, using physico-chemical knowledge, to elucidate causes of chemical and/or physical stability problems and the prevention or minimization of these problems.

Selected Publications

"Catalysis of Anhydride Formation in Aqueous Solutions of Dicarboxylic Acids," J. D. McRae (with T. Higuchi and A. C. Shah) *J.A.C.S.*, 88:4015 (1966).

Pharmaceutics - Dr. Kenneth G. Nelson, Associate Professor

Research interests are generally in the area of diffusion and transport phenomena in pharmaceutical systems. Current activity centers around diffusional behavior of drugs in solutions of hydrophilic colloids, dissolution rates, and the mechanism of the reaction of fluoride salts with synthetic tooth mineral, hydroxyapatite.

Selected Publications

"Determination of the Stability Constants of Stannous Fluoride Complexes by Potentiostatic Titration," K. G. Nelson, (with K. N. Amin), J. Pharm. Sci., in press.

"Effects of Polyelectrolytes on Drug Transport I: Diffusion," K. G. Nelson, (with K. F. Farnag), J. Pharm. Sci., 62:1435 (1973).

" SnHPO_4 from the Reaction of Stannous Fluoride and Hydroxyapatite at Low pH," K. G. Nelson, (with C. A. Bainbridge), J. Dent. Res., 52:318 (1973).

"The Kelvin Equation and Solubility of Small Particles," K. G. Nelson, J. Pharm. Sci., 61:479 (1972).

"Mechanism of Fluoride Uptake by Hydroxyapatite from Acidic Fluoride Solutions," K. G. Nelson, (with W. I. Higuchi) J. Dent. Res., 49:1541 (1970).

Biopharmaceutics - Dr. Kenneth W. Miller, Associate Professor

Interests include the absorption, distribution, metabolism and excretion of drugs in animals and man. Current interest includes the effect of dosage form design on the bioavailability of aminophylline and diphenylhydantoin.

Selected Publications

"Effect of Triton X-100 on the Conjugation of Tetrahydrocortisone, In Vitro," K. W. Miller, (with E. C. Heath, K. H. Easton and J. V. Dingell), Biochem., Pharmacol., 22:2319 (1973).

"The Intracellular Localization of Δ^9 -Tetrahydrocannabinol in Liver and its Effects on Drug Metabolism In Vitro," K. W. Miller, (with J. V. Dingell, E. C. Heath and H. A. Klausner), Biochem. Pharmacol., 22:949 (1973).

"The Interaction of Drugs with the Conjugation of Tetrahydrocortisone and a Method for the Measurement of the Formation of its Glucuronide, In Vitro," K. W. Miller, (with J. V. Dingell), J. Pharmacol. Exptl. Therap., 178:602 (1971).

"p-Chloramphetamine-Species Differences in the Rate of Disappearance and the Lowering of Cerebral Serotonin," K. W. Miller, (with E. Sanders-Bush and J. V. Dingell), Biochem. Pharmacol., 20:500 (1971).

"On the Mechanism of Amphetamine Potentiation by Iprindole," K. W. Miller, (with J. J. Freeman, J. V. Dingell and F. Sulser), Experientia, 26:863 (1970).

Biopharmaceutics - Dr. Ronald J. Sawchuk, Assistant Professor

Interests are in general in the area of kinetics of drug absorption and disposition in laboratory animals and humans. Particular interests include the assessment of bioavailability of drug dosage forms. Current research activities are directed toward the investigation and disposition at steady state.

Selected Publications

"Mixed First-order and Capacity-limited Elimination of 4-Aminoantipyrine in the Rabbit under Steady-State Conditions," R. J. Sawchuk, (with T. N. Tozer), Fifth International Congress of Pharmacology, Abstracts of Volunteer Papers, p. 202, July 1972.

"Stirring Apparatus for the Investigation of Unstable Strongly Adsorbing Chemicals," R. J. Sawchuk, (with J. M. Anderson and J. G. Nairn) J. Pharm. Sci., 55:1463 (1966).

"Rate Studies on the Binding of Bilirubin by Ion-Exchange Resins," R. J. Sawchuk, (with J. G. Nairn) J. Pharm. Sci., 57:1896 (1968).

PHARMACOGNOSY

Pharmacognosy is a biological science concerned with obtaining medicinals from nature and understanding how and why nature produces them. Medicinals from highly diversified biological systems such as animals, insects, marine life, microorganisms, plants or tissue cultures may be studied.

GRADUATE PROGRAM IN PHARMACOGNOSY

The Pharmacognosy Department at the College of Pharmacy, University of Minnesota, presents a comprehensive program of coursework and research offerings leading to the M.S. and Ph.D. degrees. The program provides an opportunity to study the medicinals in biological systems from any one of the following three perspectives: biochemical (product biosynthesis, isolation and identification), botanical (chemotaxonomy, ethnobotanical, growth and physiology), and microbiological (antibiotics, biotransformations, immunology, tumor antigens). Because of the multidisciplinary nature of pharmacognosy, each student's program will be constructed to meet his specialized needs and interests. In addition to the coursework offered within the Pharmacognosy Department, the student may also be engaged in interdisciplinary studies with other University departments such as biochemistry, botany, microbiology, medicinal chemistry, and pharmacology.

Each student conducts original research under the supervision of a staff member who is selected by the student within one year of his matriculation. Such research is directed toward the development of the M.S. or Ph.D. thesis and is of central importance in the training of the candidate. Current research in the Pharmacognosy Department is concerned with the growth, physiology, and biosynthesis of medicinals in higher plants; the use of multi-liter plant suspension cultures for the biosynthesis or biotransformation of medicinals; the development of antitumor agents; and the biotransformation of steroids in animal and microbial systems.

Specific research interests of faculty members in this department are listed below:

Medicinal Plant Tissue Culture - Dr. E. John Staba, Professor and Head, Director of Graduate Studies in Pharmacognosy

A study of free cells and differentiated tissues derived from medicinal plants for their ability to biosynthesize and biotransform alkaloids, antibiotics, cardenolides, hallucinogens, steroids, etc. The biological systems examined are aseptic, continuously subcultured, and grown as suspensions in either Erlenmeyer flasks or pilot-scale fermentors. Of further interest and study are the constituents and pharmacology of medicinal plants such as ginseng.

Selected Publications

"Lipids in Plant Tissue Cultures. II. Unusual Fatty Acids in Lipids of *Hydnocarpus anthelminticus* Cultures," E. J. Staba, (with F. Spener and H. K. Mangold), Chem. Phys. Lipids, 12:344-350 (1974).

"Aquatic Plants from Minnesota, V. Digestibility and Fermentation of Aquatic Plants," E. J. Staba, (with J. G. Linn and R. D. Goodrich), Bulletin No. 70, Water Resources Research Center, University of Minnesota, (1974).

"American and Korean Ginseng Tissue Cultures: Growth, Chemical Analysis, and Plantlet Production," E. J. Staba, (with J. J. Jhang and J. Y. Kim) In Vitro, 9:253-259, (1974).

"Allergens from Short Ragweed Leaf Tissue Cultures," E. J. Staba, (with A. Shafiee), In Vitro, 9:19-23 (1973).

"Studies on the Ginseng Plants (I) Saponins and Sapogenins from American Ginseng Plants." E. J. Staba. (with J. Y. Kim), Kor. J. Pharmacognosy, 4:193-203 (1973).

Mechanisms of Steroid Metabolism and Transformation - Dr. Yusuf Abul-Hajj,
Associate Professor

A study of the stereochemistry and mechanism of enzymic hydrogenation and dehydrogenation reactions is currently under investigation. Another area of investigation is the microbial transformation of steroids and alkaloids. Other areas of interest include a comparative study of the rates of enzymic hydrogenation reaction in the liver and hepatoma, steric aspects of catalytic hydrogenation and isolation of antibiotics from fungi, and the development of diagnostic procedures for the differentiation between hormone-dependent and hormone-independent breast tumors.

Selected Publications

"Partial Purification of Antigen E from a mixture of stems and leaves of Short Ragweed Plant," Y. J. Abul-Hajj, (with A. Shaffiee and E. J. Staba), J. Pharm. Sci. (In press).

"Antimicrobial Effects of Aquatic Plants from Minnesota," Y. J. Abul-Hajj, (with K. L. Su and E. J. Staba), Lloydia, 36:80 (1973).

"Preliminary Chemical Studies of Aquatic Plants from Minnesota," Y. U. Abul-Hajj, (with E. L. Sue and E. J. Staba), Lloydia, 36:72 (1973).

"Stereochemistry of C-1,2-Dehydrogenation of 5 β -Pregnane-3, 11, 20-trione by Septomyxa affinis," Y. J. Abul-Hajj, J. Biol. Chem., 247, 686 (1973).

"Stereospecificity of Hydrogen Transfer from NADPH by Steroid Δ^4 -5 α - and Δ^4 -5 β -Reductase," Y. J. Abul-Hajj, Steroids, 20:215 (1972).

Immunology - Dr. Orval Mullen, Assistant Professor

Of current interest is isolation and characterization of tumor transplantation antigen from tumor tissue, tissue culture and freeze storage of animal cells, and in vivo and in vitro assay of the cellular immune response. An additional area of interest is in the application of immunological techniques such as radioimmunoassay and fluorescent microscopy to the field of pharmacognosy.

Selected Publications

"Evaluation of Dye Exclusion and Colony Inhibition Techniques for Detection of Polyoma-Specific, Cell-Mediated Immunity," O. L. Mullen, (with M. C. Dodd and J. P. Minton), J. Nat'l. Cancer Inst., January, 1975.

"The Immunizing Biologicals," O. L. Mullen, Minnesota Pharmacist, 27(11): 8, (1973).

"Specific Immunocompetence of Mouse Spleen Cells for Polyoma Transplant Antigen," O. L. Mullen (with M. C. Dodd), J.R.E.S., 11(4):409, (1972).

PHARMACY ADMINISTRATION

Pharmacy Administration examines the social, economic, psychological and political aspects of the organization and distribution of drugs and pharmaceutical services; the use, abuse and non-use of drugs and drug information by patients and practitioners; and the role of the pharmacist as a health practitioner in relation to the public, his profession and other health practitioners.

The widespread use and dependency on drugs and drug products in today's society coupled with an increased utilization and application of pharmaceutical services has created a need for individuals who can study the social, psychosocial, political, legal, historical and economic factors that impinge upon the use.

GRADUATE PROGRAM IN PHARMACY ADMINISTRATION

This graduate program is designed for the graduate who is looking for an education and experience quite unlike the physical and biologically oriented undergraduate program in pharmacy. Rather, the program fosters the application of behavior-oriented interdisciplinary theories to pharmacy problem solving and pharmacy system development. A flexible program leading to the M.S. and Ph.D. degrees is available. Close cooperation is maintained with joint programs in the social and behavioral science departments and with the other health science school.

Specific research interests of faculty members in the department are listed below:

Pharmacy Administration - Dr. Albert I. Wertheimer, Associate Professor, Director of Graduate Studies in Pharmacy Administration

Studies encompass the socioeconomics of the drug use process and organization and delivery studies on the role of pharmacy in the health care delivery system.

Selected Publications

"The Past and Potential of Clinical Pharmacy," A. I. Wertheimer (with J. E. Knoblen), The Apothecary, 86, No. 2, 10, February 1974.

"Professional Services--Some Necessary Distinctions," A. I. Wertheimer, Journal of the American Pharmaceutical Association, NS12, No. 5- 260 (May 1973).

"Prescription Accuracy: Room for Improvement," A. I. Wertheimer, (with C. Ritchko and D. W. Dougherty) Medical Care, 11, No. 1, 68-71 (January-February, 1973).

"Generic Drug Pricing," A. I. Wertheimer, Drug and Cosmetic Industry, 107, 4, 52 (October, 1970).

"Patent Licensing of Pharmaceuticals," A. I. Wertheimer, (with R. V. Evanson), Inquiry, VII, 3, 69 (September, 1970).

Pharmacy Administration - Dr. Hugh F. Kabat, Professor, Assistant Dean

Patient compliance studies; job satisfaction studies; drug distribution; patient consultation studies; drug utilization review studies; role definition of extended roles for pharmacists and drug induced modification of laboratory test values.

Selected Publications

"A Client Developed Methadone Maintenance Program," H. F. Kabat (with R. Levine) Internat. J. Of the Addictions, Vol. 10, No. 5, 1974.

"Blood Pressure Screening in Community Pharmacies," H. F. Kabat (with M. Hammel), J. Amer. Pharm. Assoc. NS14 (4): pp. 196-197 (Apr.) 1974.

"Assessing Employee Job Attitudes," H. F. Kabat (with M. Hanson) Amer. J. Hosp. Pharm., 31:269-271 (Feb.) 1974.

"Drug Induced Modifications of Laboratory Test Values," H. F. Kabat, (with M. P. Elking) Laboratory Medicine, Race, G. J. Ed. Vol. 1, Chapter 14, pp. 1-59 1973.

Social Psychology - Carl A. Johnson, Ph.D.

Decision process and risk taking behavior, small group processes, personal control, drug and placebo response.

Selected Publications

"The Experience of Duration as a Function of Complexity of Visual Stimuli Briefly Presented," C. A. Johnson (with C. Anderson, M. E. Kinsbourne and T. Hines), in preparation.

"An Attribution of Personal Control Model for the Experience of Pain and Placebo Effects," C. Johnson (with C. Anderson), Paper submitted for presentation at the 1st International Congress on Patient Counseling in Amsterdam, May 1975.

"The Effects of Personal Control on Expectations for Environmental Contingencies," C. Johnson (with C. Anderson) Submitted to the Journal of Personality and Social Psychology, August 1974.

"Personal Control and Privacy," C. Johnson (with C. Anderson), In S. Margulis (Ed.), Privacy Coming of Age, Chapel Hill: EDRA, 1974.

"Delay of Consequences and The Riskiness of Decisions," C. Johnson (with E. E. Jones and C. Anderson), Journal of Personality, December 1973.

Pharmacology - Lawrence C. Weaver, Professor, Dean

Health care delivery systems, continuing competency and professional education.

Selected Publications

"Continuing Education, An Opportunity," L. C. Weaver, Am. J. Pharmacy.

"Accreditation in Pharmaceutical Education," L. C. Weaver, (with T. M. McKennel), Am. J. Hosp. Pharm.

"Clinical Pharmacy Concerns," L. C. Weaver, Am. J. Pharm. Ed., 37:536, 1973.

"Address of the Vice President: Shouldn't We Try?" L. C. Weaver, Am. J. Pharm. Ed., 37:395, 1973.

"AAPC Reorganization," L. C. Weaver, Am. J. Pharm. Ed., 37:349, 1973.

"Learning--A New Approach to Pharmacy Education," L. C. Weaver, Pharmacopa, 12:5, 1973.

Medical Sociology - Theodor J. Litman

Health care organization and social, psychological aspects of dealing with the treatment process.

Selected Publications

"Comparative Analysis of Health Care Systems - A Holistic Approach," T. J. Litman (with D. Robins) Institute of Interdisciplinary Studies, American Rehabilitation Foundation, International Conference on Health Planning, May 19-21, 1970, Northstar Inn, Minneapolis, Minnesota, Social Sciences and Medicine, January, 1972.

"Health Care and the Family - An Intergenerational Analysis," T. J. Litman, Medical Care, September, 1970.

"The Uneasy Equilibrium, T. J. Litman (with O. Anderson) Sociological Quarterly, 1969-1970.

"Medical Care", T. J. Litman (with R. Scott and E. Volkart), Medical Care, November, 1967.

"Sociology and Rehabilitation," T. J. Litman, (with M. Sussman), Sociological Review, Fall, 1967.

"Health Process in the United State 1900-1960," T. J. Litman (with M. Lerner and O. Anderson), Sociological Quarterly, Summer, 1966.

Appendix B

- Letter of certification
for a Clinical Pharmacokinetics Laboratory



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

REGION V

300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

SOCIAL SECURITY ADMINISTRATION

March 5, 1975

Refer to: HI:S7
Provider Number: 24-8031

Kenneth W. Miller, Ph.D.
Director
Clinical Pharmacokinetics Laboratory
College of Pharmacy - University of Minnesota
Minneapolis, Minnesota 55455

Dear Dr. Miller:

We are pleased to inform you that your laboratory meets the requirements for coverage of its services under the Medicare program (Title XVIII of the Social Security Act). Your laboratory is approved for tests and procedures as indicated on the enclosed list.

Your laboratory has been assigned the identification number shown above. The number should be entered on all forms and correspondence relating to the Medicare Program.

The State Agency advised you of certain deficiencies which were noted during the survey of your laboratory. Your continued approval in certain or all of the specialties on the enclosed list is conditional on your correction of these deficiencies. We have reviewed the plan and timetable for correction of these deficiencies which you submitted and will be in close touch with the State Agency to assure that appropriate steps are taken. The State Agency will be pleased to furnish any consultation you may need. You should also report to the State Agency any changes in staffing, services, or other characteristics which might affect your certification status.

We welcome your participation and look forward to working with you in the administration of the Medicare Program.

Sincerely yours,

James R. Salla
Program Officer
State Operations Branch
Health Insurance

Enclosure

Appendix C

-- A GUIDE TO UNIVERSITY
OF MINNESOTA ACTIVITIES
IN RESPONSE TO THE
PROBLEMS OF CHEMICAL
MISUSE AND ABUSE
Drug Information and
Education Program
College of Pharmacy

A Guide to
University of Minnesota Activities
in Response to the Problems of

Chemical Misuse and Abuse

Compiled by:

Drug Information and Education Program
N620 Elliott Hall
University of Minnesota
Minneapolis, Minnesota 55455
(612) 376-3150

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Introduction

For many years, individuals from the numerous campuses, colleges, and departments throughout the University of Minnesota have been active in providing services, conducting research and developing curricula directed toward alleviating problems connected with chemical misuse and abuse (alcohol, tobacco, caffeine, prescription drugs and illicit substances). The impact of these efforts has been minimized as a result of duplication of effort and lack of coordination between and amongst University personnel. Since 1973, the Drug Information and Education Program has been involved in facilitating communication and conveying community needs to interdisciplinary groups within the University, which has resulted in the development of responsive programmatic activity. This booklet is provided to help those within and outside the University community to gain access to individuals and programs active in areas relevant to their interests and needs.

Drug Information and Education Program

Lawrence C. Weaver, Ph.D., Director

Marc G. Kurzman, R.Ph., J.D., Associate Director

The Drug Information and Education Program (DIEP) is an administrative office which funds and coordinates research, curricular and service activity related to drug abuse within the University. Pursuant to an agreement between the State Alcohol and Drug Abuse Authority (Drug Authority) and the University, all applications for funding generated within the University related to drug abuse are to be sent to DIEP for review and comment prior to their being funded.

The Drug Authority, created pursuant to federal and state law, is the agency responsible for the development of a Comprehensive State Plan for the distribution of monies to be used in the development of drug abuse prevention functions in the state. "Prevention" is defined as any program or activity relating to drug abuse education, training, treatment, rehabilitation or research. Further, such activities are covered regardless of the identity of the agency conducting them or its primary mission. For example, monies presently being used to fund contracts and/or grants from the

Alcohol, Drug Abuse, and Mental Health Administration will be distributed primarily through a formula grant program directly to the Drug Authority and then redistributed in the state in accordance with the Comprehensive State Plan. DIEP is responsible for preparing the University component of the Comprehensive State Plan.

As community, University and/or federal needs are manifested to DIEP, Program staff draw together resources from numerous departments, colleges and campuses to respond to these needs. Two committees have been established to assist Program staff in their performance of their duties. The Program Advisory Committee includes members from each of the state University campuses and various state agencies involved in activity directed toward alleviating drug abuse problems. The function of the Program Advisory Committee is to serve as a liaison between the University and state agencies so that needs manifested throughout the state can be communicated to the University. The Program Implementation Committee (PIC) is presently open for membership to all members of the University community involved in, or potentially interested in, problems of drug abuse. The function of the PIC is to provide a forum for interchange of ideas and to foster an interdepartmental cooperative response to needs indicated by the Program Advisory Committee. Review and comment on proposals submitted from the University is conducted by the PIC through specialty interest subcommittees which review proposals related to their areas of expertise. Before "review and comment" from DIEP is forwarded to the Drug Authority, the individuals who are involved in the development of the proposal have the benefit of the PIC report so they can make appropriate changes if necessary. Further, the communication network established via the PIC serves as a conduit and catalyst for cooperative efforts as the DIEP staff or others learn of the availability of money and existence of need. The membership of each committee is as follows:

Program Advisory Committee, representatives from:

University of Minnesota

Twin Cities
Duluth
Morris

State Agencies

Department of Education
Department of Health
Department of Manpower Services
Department of Public Welfare
Department of Vocational Rehabilitation

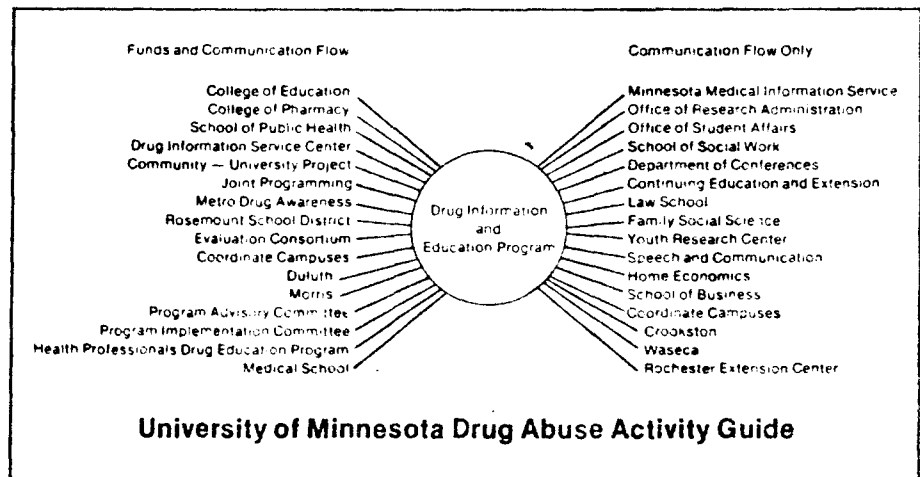
Minneapolis Health Department

Minnesota Drug Assembly (Consortium of Street Agencies)

Minnesota Legislature

Program Implementation Committee, representatives from:

- College of Education
 - Educational Psychology
 - Center for Educational Research and Development
 - Philosophical, Psychological and Sociological Foundations
 - Secondary Education
 - Department of School Health Education
- College of Pharmacy
- Drug Information Service Center
- Family Social Sciences
- Health Professionals Drug Abuse Education Program
- Law School
- Medical School
 - Pharmacology Department
 - Psychiatry Research
 - Psychopharmacology Research and Training Program
- Minnesota Medical Information Service
- Office of Research Administration
- Office of Student Affairs
- School of Business Administration
- School of Public Health
- School of Social Work
- College of Liberal Arts
 - Department of Sociology
- University of Minnesota
 - Duluth
 - Morris
 - Rochester Extension Center



Curricular Activities

Twin Cities Campus

College of Pharmacy

MedC 5494. Instrumentation in Medicinal Chemistry. Abdel-Monem, Fullerton

Modern approaches to drug analysis. 1974-75 and alternate years — independent study. 1975-76 and alternate years — a series of laboratory exercises and lectures on NMR, MS, high pressure LC, radioimmune assay, use of scintillation counters, forensic toxicology and forensic drug identification, monitoring of drug therapy, drug metabolism, law related to drug analysis, and emergency poison identification.

Phar 5285. Drugs and Society. Anthony

"Drugs and Society" is an innovative course of study on drugs, drug use and drug use problems which is offered three times each year through the University's College of Pharmacy and Interdisciplinary "Health Sciences Unattached" Department, and is in part supported by the Drug Information and Education Program. This course — interdisciplinary in its student body as well as its perspectives on drug use — grew out of an earlier course, "Community Drug Education," which prepared pharmacy students for drug education activities, and was stimulated in its growth by "Project SPEED", a National Institutes on Mental Health and Drug Abuse-funded interdisciplinary drug education curriculum development project. Like its predecessor, "Drugs and Society" is directed toward preparing students to be able to answer questions about drugs and drug use, and to participate in drug education and other drug use problem prevention activities.

The course is organized around a well-researched set of goals and objectives such as: "When asked 'What happens when someone takes a drug?' the learner shall recognize that the inquirer may be asking for help in the form of advice about drug use, or in the form of a referral to a counselor or other 'treater', and shall state or identify at least one way of determining whether this is so;" and "When presented with an individual with a drug use problem, the

learner shall demonstrate an empathic, non-judgmental approach toward that individual."

The student is viewed as having a need to understand the "relevance" of the goals and objectives, and as having an individual — and perhaps unique — learning pattern, and the course has a flexibility — not seen in most courses — to address these needs and individual patterns. To this end, the course offers the student a selection of "learning pathways", all directed toward the attainment of the course objectives. Included in these "pathways" are values confrontations, propositional ("what if") exercises, encounters with a variety of drug users, law enforcement officials, "treaters", lawyers and others involved in drug use problem prevention, treatment and control, as well as other learning strategies.

One inflexible part of the course is that no student "graduates" from it without having demonstrated attainment of the course objectives in some fashion. Measurement instruments have been developed for this purpose and continue to be improved — program evaluation is continuous, and is built into the course. To counterbalance this strong emphasis on goal attainment and competency, the student is given total freedom in designing a grading contract project for determination of a final grade; these projects represent the individual expectations and interests of the students, above and beyond goal attainment, and encouragement to be "fantastical" in project design is provided.

Phar 5286. Drugs and Society Workshop.

This course offering enables students who have become involved in community programs during "Drugs and Society" as well as those who desire such involvement, to explore new patterns of involvement and participation in community solutions to drug problems. Weekly forums and seminars supplement this community work, providing a chance for sharing ideas and problems, as well as for didactic presentations on topics ranging from grantsmanship to legislative drafting and lobbying.

For some students, the "Drugs and Society Workshop" provides an opportunity to receive credit for successful completion of approved street agency staff training sessions and for involvement in the day-to-day operations of those agencies; for others, it means helping with the design and implementation of a new parent-child communication program. Still others research such problem-areas as the use of stimulants in the treatment of hyperkinesis, or folk-myths surrounding the use of marijuana. Participation in community projects sponsored by the College of Pharmacy Drug Information — Community Drug Education Program is also available for credit through this course.

Phar 5970. Directed Studies.

Directed studies in drug use problems, their prevention and/or treatment.

Phar 5235. Legislative Drafting. M. Kurzman

Predominantly for law students and Pharm-D candidates who wish to be involved in the researching and drafting of legislation pertaining to control of dangerous drugs as well as lobbying activity aimed at implementation of the proposed legislation.

School of Public Health

The School of Public Health, which has as a part of its assigned mission the instruction in health for the University, has since early 1969 been carrying forth coursework focusing on the problem of alcohol, tobacco and other drug abuse. The School has been meeting these academic responsibilities basically through two areas of instruction — the Chemical Dependency Counseling Program and the Fundamentals of Alcohol and Drug Abuse courses for College of Education students and other University undergraduate students. Faculty also are utilized throughout the University to guest lecture in other departmental courses covering drug abuse.

In addition, the School has offered on a very limited basis each quarter, an interdisciplinary graduate seminar for Public Health and selected graduate students from other academic areas. However, this latter activity, while it is a high priority for the School, has not had financial support that would enable the School to recruit and employ faculty with the necessary competency, ability and time to fully develop the critically needed graduate programs. Funding is again being sought for the 1975-77 biennium through the University's Legislative Special Request for the Drug Information and Education Program.

PRE-SERVICE AND CONTINUING TEACHER EDUCATION

The overall objective of these courses is to help students in the teacher education program acquire a broader understanding and perspective of alcohol, tobacco and other drug abuse as a multifaceted, widespread, contemporary public health problem of great magnitude; and to recognize and accept education's role and responsibility for helping to prevent or modify the severity and the course of the problem in individuals and society. In addition, it is the goal of these courses to provide school personnel with the basic knowledge about alcohol and drug abuse required for state teacher certification. All of these undergraduate and graduate course offerings are cooperatively planned and conducted jointly with College of Education and other University faculty.

Focus of these teacher preparation offerings is on the fundamental issues related to the use of all drugs — legal or illegal —

with special emphasis given to abuse and dependency. Alcohol is heavily stressed as the single most abused drug in this society and with the most severe consequences for abusing and dependent individuals as well as for the society. Special attention is given to fostering a more objective attitude toward drug use, abuse and dependency; differentiating between these classes of use; and discouraging making personal or professional judgments as to causes for individual or social drug abuse and dependency. Instead, focus is placed on factual, up-to-date information on pharmacological and legal aspects as well as practical methods of prevention, intervention, counseling, referral, first-aid, and classroom strategies which well-trained teachers can employ. Consultation by School of Public Health faculty is employed to assist College of Education faculty in incorporating public health concepts and drug information into educational methodology courses for pre-service teachers. While content of the courses is designed to satisfy the basic requirements for teacher certification by the State Department of Education, it is structured to enable the non-teacher to acquire knowledge and attitudes beneficial to their own personal and professional fields. Content is offered in courses devoted entirely to alcohol and drugs as well as being included in the basic personal and community health courses offered by the School of Public Health for an undergraduate liberal education. In addition, a special graduate course has been offered for teachers in service and public health school nurses during First Summer Session under both public health and education course numbers. Also, a continuing education course in communication skills and group leadership in drugs is offered for teachers in service through the Department of Evening and Special Classes, Continuing Education and Extension.

PubH 3004. Basic Concepts in Personal and Community Health.

Greene, Schwanke, Rothenberger, others

This course is structured to provide for the basic health education preparation of College of Education and other University students and includes about 20 hours of basic drug education on an elective basis. Students enrolled in the course may elect the drug section or a health section. Education majors needing the drug content for state certification meet both the health and drug requirement through this single registration.

PubH 3033. Fundamentals of Alcohol and Drug Abuse. Schwanke,

Rothenberger, others

This course is designed to provide the basic health oriented content on drugs for education majors as well as other University students. Content, through Fall Quarter 1974 has been taught conjointly with the PubH 3004 Drug Section above. Beginning Winter

1975 it will be taught as a totally separate offering with less emphasis on educational methods and greater emphasis on prevention, casefinding, treatment, and epidemiological and demographic characteristics.

PubH 3004X or 3033X. Fundamentals of Helping Relationships: Basic Skills. (Open to students with basic registration in PubH 3004 or 3033) Fischer

This extra credit section is offered to provide students with an introduction into the theory and skills of creating an effective helping relationship. Course includes personal needs of the helper and verbal, non-verbal, and self-involving behavior.

PubH 3004X or 3033X. Doing Drug Abuse Prevention in Schools. (Education majors only with basic registration in PubH 3004 or 3033) Norem-Hebeisen, Evans

These sessions will provide a mixture of lectures, demonstrations and experience regarding alternative modalities (classroom process, specific teaching unit content, and interpersonal style) as means to prevent drug abuse.

PubH 3004X or 3003X. Teaching "Drug Education" to Students. (With basic registration in PubH 3004 or 3003) Norem-Hebeisen, Evans

These sessions will provide a mixture of lecture and experience in the methodology and course content of drug education for secondary school students. The course will look at alternative approaches to drug education programs and the setting where they will be most useful.

PubH 5032. (Health 5400). Educational Aspects of Drug Use and Abuse. Schwanke, Rothenberger, others

This has been a graduate level, Summer only offering designed specifically for teachers in service dealing with curriculum concepts, teaching methods and materials and prevention content aimed at classroom strategies.

PubH 5034. Topics in Alcohol and Drug Abuse. Schwanke

A graduate seminar and independent study course offered to provide Public Health students with knowledge and skills in prevention and treatment of chemical dependency.

PubH 5034. Topics In Alcohol and Drug Abuse. T. Kurzman

This course is currently being offered to provide credit for people training to be facilitators in the Communication Skills Seminar (described in research section, page 20).

CHEMICAL DEPENDENCY COUNSELING PROGRAM

The primary objective of the Chemical Dependency Counseling Program is to provide a uniform, high-quality continuing education experience (leading to an undergraduate counseling certificate) for professional and paraprofessional staffs of drug and alcohol agencies and services. This interdisciplinary program has as a secondary objective, the provision of continuing education for other health professionals such as hospital and public health nurses, social workers, psychologists, clergy, physicians, juvenile workers, school counselors, law enforcement personnel and others whose duties include developing helping strategies for the chemically dependent.

The Chemical Dependency Counseling Program is a collaborative training effort involving the School of Public Health, the Department of Evening Classes of the University's Continuing Education and Extension, and academic staff from selected community drug treatment agencies. Funding for the Chemical Dependency Counseling Program is primarily in the form of a training grant awarded to the School of Public Health by the National Institute of Drug Abuse with supplementary funds from Continuing Education and Extension. The program has never received state monies, but will be looking to the Minnesota legislature and/or the State Alcohol and Drug Abuse Authority for future support as federal agencies play less of a direct role in funding drug abuse training activities. Additional funding will also be needed if the program is to realize its potential impact on the training needs for all alcohol and drug abuse workers in Minnesota.

The Program is divided into two phases. First, the classroom phase which is spread over several academic quarters, is used to provide an orderly progression of background material covering the pharmacological, behavioral, psychosocial, and environmental aspects of chemical use, abuse, and dependency. Several of the academic courses supplement didactic material and group experiences related to the development of counseling skills. Instructors are drawn from among specialized University faculty, and also from the highly experienced staffs of the many agencies in and around the Twin Cities.

The second phase is a six month (150 working days) clinical internship, during which time those students electing to complete the requirements for the certificate are assigned to approved community agencies to work in a variety of counseling capacities under skillful supervision wherein interns apply the skills learned in the courses to real situations. This application of the training is extremely crucial as it represents the last evaluation of the intern's ability and suitability for drug counseling prior to awarding the undergraduate certificate which is one of the recognized credentials in Minnesota for lay drug counselors.

The staff is currently involved in an outreach effort in collaboration with the Concentrated Employment Program and the University of Minnesota, Duluth, to provide education and training for alcohol and drug abuse workers in the Northeast section of Minnesota. The model being used is seen as being feasible for providing similar services in other parts of the state. Tentative plans are also being developed in cooperation with the Higher Education Coordinating Commission to offer an education and training program in the Range area of the state.

PubH 3030. Fundamental Aspects of Alcohol and Drug Abuse.
Schwanke, Anderson, Kincannon, Heilman, others

This is the first course in a three-course series designed to expose the students to a wide range of topics and issues related to the nature of drug dependency and specific counseling techniques. The intent, at times, is to challenge students' personal views on drug dependency and the drug dependent person and to create an awareness on their part that differing theories do exist on the nature of drug dependency and approaches to rehabilitation and/or recovery.

Emphasis in this first course is on the historical and cultural perspectives of the drug abuse problem and the principles of pharmacology as applied specifically to the various classifications of mood altering chemicals.

PubH 3031. The Disease Process and Social Implications of Drug Abuse. Kincannon, Heilman, Anderson, Kurzman, Schoener, others

This is the second course in the series of three core courses offered by the Chemical Dependency Counseling Program. In this course the student begins to examine several models of dependency in an attempt to examine the reasons why some individuals become dependent on drugs. We will also begin to take a critical look at the various treatment modalities and some general issues related to treatment of drug dependency. In addition, this course deals with some of the legal and social problems related to drug dependency.

PubH 3032. Counseling the Alcoholic and Other Drug Dependent Persons. Anderson, Swift, Pletcher, others

This course is devoted to exploring such topics as what is a chemical dependency counselor, what are some specific counseling techniques that apply to working with the chemically dependent, what are some of the basic principles of group counseling, and how do we include the family in our efforts to assist the dependent person.

It appears that different orientations to counseling are more effective with certain subpopulations and even with individuals within that subpopulation. For this reason, we try to expose the students to a variety of counseling theories and allow them the opportunity to pick and choose the various concepts that enable them to work effectively with dependent persons.

PubH 3035. Internship in Alcohol and Drug Abuse. Meads, others

The 150-day (1200 hour) internship has been divided into three "tracks," each of the three covering one facet of drug treatment and rehabilitation. The community track encompasses out-patient programs, referral agencies, community mental health programs, industrial counseling, etc. The inpatient track deals with the one-to-one counseling, intake procedures, and post-treatment planning. Finally, the residential after-care track covers the so-called halfway, quarterway and three-quarter way houses. The internship has been designed to expose the intern to each of these three areas, though the length of time in each will vary according to the student's needs and desires.

PubH 3036. Basic Helping Skills. Armstrong, Meads, Fischer

The course provides the background and skills in the use of dyadic relationship for promoting personal growth and development in clients. The course material covers one's needs to be a helper, effective nonverbal communication, effective verbal responses, self involving behavior, understanding others' communication, and establishing effective helping relationships. The course incorporates small groups, role playing and practicing both effective and ineffective methods in addition to traditional teaching methods.

PubH 5036. Group Counseling Techniques. Pletcher, others

This course is designed to use personal experience in the process of enhancing skills and understandings in group process. Laboratory participants explore the impact of personal behavioral style on group process. Techniques of facilitating group interaction, both in group therapy and in staff meetings are considered. Participants learn through a progression of realistic simulation and problem-solving exercises, self-assessment techniques and lecturette presentations. Emphasis is upon the skills involved in setting a positive group climate, the analysis of transactive forces, and goals in drug dependency group treatment.

PubH 3034. Chemical Dependency: A Family Illness. D. Wegscheider, S. Wegscheider

This course provides background and skills for the use of helping professionals. The goal is to enable students to grow into being effective helpers by growing in their own wholeness. The course

material covers family systems, congruent and incongruent means of coping with stress, responsibility, and making choices, alcoholism as the disease of the whole person, alcoholism as the disease of the whole family, new systems needing new nurturing, and the therapist's need for nurturing. The course incorporates group experiences, feedback exercises, as well as traditional teaching methods.

School of Business

IR 8000. Industrial Control Systems for Chemically Dependent Employees. (Available to representatives of management, labor and graduate students in industrial relations) Wrich

This course is designed to provide information and data on the impact of chemically dependent employees and other troubled employees and to develop skills necessary to design, implement and maintain systems to control human and productivity loss.

College of Education

PsyF 5178. Psychology of Drug Abuse. Wong

Psychological and sociological problems of drug abuse with special reference to schools, teachers, and students. Television program titles include: Drugs and the Schools, Drug Use and Abuse Patterns, Personal Values and Drug Use, Psychological Causes of Drug Use and Abuse, Drug Education — Alternatives, Sociological Causes of Drug Use, Drug Education — Attitudes, Laws, Detection and Crisis Intervention, Street and Referral Agencies, Chemical Dependency, Rehabilitation.

Law School

Law 5864. Seminar: Drug Crimes. Park

The first three sessions are devoted to discussions of social policy issues and the effects of drugs. The next six sessions deal with litigation issues in drug cases: entrapment, search and seizure, buyer's agent defense, nature of "possession", drug induced intoxication as a defense, constitutionality of drug statutes.

Research Activities

Twin Cities Campus

Alcohol Education — An Alcohol Use Intervention Project

Jim Anthony, Principal Investigator

This project has as its objectives:

1. To develop an alcohol use intervention project for underage drinkers referred to the juvenile corrections system which will produce significant cognitive and affective gains associated with responsible alcohol use and positive alternatives to alcohol use and which will produce a demonstrably positive effect on alcohol use behavior.
2. To evaluate the project in terms of its effect on postintervention alcohol use patterns within established limits regarding confidentiality of data, and in terms of its effect on cognitive and affective dimensions associated with the responsible use of alcohol and positive alternatives to alcohol use.
3. To communicate the results of this project so that they can be utilized by other programs.
4. Should positive evaluation results be obtained, to continue to implement the project in institutional and community corrections settings and in pre-trial diversion programs for juveniles now labelled as "delinquents" because of underage drinking.

Funding: LEAA, \$8,000; DIEP, \$2,000.

Overdose Aid — A Drug Use Intervention Project

Jim Anthony, Project Coordinator

This project has as its objectives:

1. To identify, through the juvenile court system, a population of youths with a high probability of past or current drug use experience (self-reported).
2. To expose a randomly-assigned half of the identified youths to a control comparison program involving implementation of a commonly used drug information textbook and activity regimen, and to expose the other half to an experimental overdose aid-oriented drug education program.

3. To measure and to compare, by means of pre-tests and post-tests, the immediate effects of the intervention program and the control program on cognitive and affective dimensions which research has shown to be associated with responsible use of alcohol and other drugs and an acceptance of positive alternatives to drug use.
4. To establish an evaluation design which permits implementation of the intervention program at least two times during the funded year and which will yield formative evaluation results and guidelines for revision of the program after the first program is completed.
5. To measure and to compare, by means of follow-up data collection within limits established by confidentiality and the protection of constitutional rights, the long term effects of the intervention program on alcohol and drug use patterns, as well as patterns of use of positive alternatives to drug use.
6. To continue to implement the intervention program through the Drug Information and Education Program in institutional and community corrections settings, as well as pre-trial diversion programs and other relevant programs, should positive evaluation results be obtained.
7. To facilitate implementation of the program by other groups, and to expand the knowledge base in this problem area by publishing a project report and guidelines for implementation and making them available for appropriate distribution.

Funding: DIEP, \$4,200.

Development of a Drug Control Evaluation System

Albert Wertheimer, Jim Anthony

The purpose of this study is to test the hypothesis that when a drug is brought under control there will result a reduction in availability of the substance for illicit purposes, and that this reduced availability will in turn result in a change in the pattern, scope and significance of the abuse of that drug. In more detail, the study consists of:

1. Identifying the information requirements for evaluating the effectiveness of the drug scheduling;
2. Assembling, integrating and evaluating appropriate available information, and implementing an evaluation of drug controls upon 12 specified drugs;
3. Identifying data gaps in the evaluation;
4. Recommending an improved system and developing new data collection plans in performing a cost and feasibility analysis of the proposed system.

Funding: An inter-agency committee composed of representatives of DEA, NIDA and the FDA, \$93,000.

Drug Monitoring and Education for the Elderly

Maxine Hammel

This proposed project deals with the establishment of a system of drug use control and drug education for the elderly. To meet the problems associated with living alone and the elderly's health care as they relate to drugs, the project will have components which are both service oriented and education oriented. The high incidence of chronic disease in the elderly coupled with a myriad of treatment combinations (including self-medication with over-the-counter drugs), failing memory, poor eyesight, varying pharmacological responses to drugs associated with the aging process, numerous fallacies concerning drugs and health in general, and a lack of guidance and care for many of the non-institutionalized elderly outline some of the many factors contributing to the problem. The alternative to home care for the elderly, institutionalization, is both socially and economically desirable to postpone until all other alternatives have been pushed to their maximum effectiveness. The initial program participants will be health science students and faculty at the University of Minnesota. The initial target population will be elderly individuals who have demonstrated need for drug monitoring and/or education as determined by their social worker (through Jewish Family Service or Catholic Charities Program for Aging). The funded project will also attempt to provide a model for drug use control and education which can be used for other populations on an ongoing basis.

This project has as its objectives:

1. To educate health sciences (and practicing professionals) on the psychological and sociological aspects of aging and the resulting effect on drug use by the elderly population.
2. To monitor and provide drug use control on a one-to-one basis for those individuals who demonstrate a need for this type of monitoring and who are not institutionalized.
3. To educate the elderly on the proper use of prescription and over-the-counter medications through group presentations.
4. To provide and evaluate a working model which can be used on an expanded, ongoing basis in other communities for both elderly populations and other groups in need of this type of educational service.
5. To provide a base at the University of Minnesota for continuing organization and participation in the program on an ongoing basis.
6. To be a friend.

Funding: Higher Education Coordinating Commission, \$12,000.

Socio-Metric Profile of Alcoholism: A Pilot Study
Joseph Westermeyer

The proposed research has as its goal the development of a socio-metric profile for alcoholism. This program would be based on statistics routinely collected by a variety of social agencies which have some demonstrative relationship to alcoholism. Later, events with a possible — but as yet unknown — statistical relationship to alcoholism could be investigated. In this way, the effects of alcoholism on child raising, the family, and society might be assessed both qualitatively and quantitatively.

The project will first examine over a two-year period whether a valid socio-metric profile for alcoholism can be developed for Minnesota as a whole, and for geo-political units within the state. If shown to be feasible in the first two years of work, we would then seek further funding for another two years in order to establish an ongoing registry. The registry would be employed for evaluation and cost effectiveness of alcoholism programs now beginning around the state of Minnesota and for epidemiological research on alcoholism.

Funding: Public Health Service, \$75,526.

Delphic Probe
Keith Johnson

In an attempt to provide guidelines as to the future policies of the University of Minnesota in relation to the dual questions of drug abuse and drug abuse education, the Drug Information and Education Program has commissioned a Delphic survey to delineate and assess policy alternatives. The Delphi methodology is a technique which allows for the systematic collection of informed judgments on a particular topic. An essential feature of this technique is that the participants on the panel (anonymous with interaction only via the mails) consist of acknowledged "experts" in the given field.

Funding: DIEP, \$3,000.

Communication Skills Seminar
Terri Kurzman

Jointly sponsored by: Drug Information and Education Program, Metro Drug Awareness (Minneapolis Health Department), Center for Educational Development (University of Minnesota), and Minnesota State Alcohol and Drug Abuse Authority.

This program is designed to reduce and/or prevent antisocial behavior, including drug-abusing behavior, among high-risk high school students. The plan for the ten weeks of the program calls for parents *not* from the same family to meet together in small groups for the first five sessions. The subsequent five sessions

will bring the adolescent and his own parent together in interaction for increasingly greater portions of the training session, so that in the last sessions the adolescent will meet predominantly in small groups with his own parent. In the program sessions, initial stimulus materials such as short movies, value-clarification games, and role-playing techniques will be followed by discussion among adolescents and parents about drug use and abuse, self-concept, adult and peer pressures, and communication techniques. The specific objectives are to:

1. Aid schools in identifying a population of high-risk students;
2. Train the identified students and their parents in parent-student treatment-oriented discussion groups;
3. Effect immediately through the training program:
 - a. increased trust in the relationship;
 - b. increased mutual understanding of each other as separate, unique individuals;
 - c. increased sharing of information;
 - d. effective usage of "active listening" techniques;
 - e. increased self-esteem and lowered anxiety.
4. Effect immediately through the training program clarifications and changes of attitudes toward drug use and abuse.
5. Effect eventually through the training program reductions in:
 - a. truancy and attendance problems;
 - b. acting-out behavior as reflected in referrals to school and law enforcement personnel responsible for disciplinary problems;
 - c. drug use and abuse.

The program model will be a revised version of one assembled and tested successfully in three school districts through state funds from January to May, 1973. A concomitant research project is designed to demonstrate the success in each of the objectives listed above and, incidentally, to obtain more feedback for further revision.

Experimental Drug Education Curriculum for Elementary Schools Alan Briskin

Jointly sponsored by: Drug Information and Education Program, Center for Educational Development (University of Minnesota), Family Social Science (University of Minnesota), Independent School District #196, Rosemount, Minnesota, and Minnesota State Alcohol and Drug Abuse Authority.

A pilot research project was run in 1972-74 in Rosemount School District to determine the impact of experimental procedures on the moral development, communication skills development and drug content mastery of sixth grade students. The pilot years were divided into three phases: teacher training, curriculum development

and implementation. Teacher training included introduction to drug information, group facilitation and research skills. The experimental curriculum was developed by the teacher group in cooperation with the University research team during an intensive summer workshop. The implementation phases included 1) pretesting for content knowledge, stage of moral development and communication skills; 2) curriculum implementation with sixth grade students; and 3) post-testing for content knowledge, stage of moral development and communication skills.

The experimental drug education program will continue through 1976, thus extending experimental or control procedures to all 1) to cover expenses of implementing experimental and published curricula; 2) to support data collection including drug information scores, ratings of stages of moral development and ratings of communication skills; 3) to support analysis of the data; and 4) to support the development of specific procedures for a follow-up study of experimental and control subjects' drug related behavior after three years when they are in the ninth grade. During this next year, the experimental treatment will involve the following components:

1. Training teachers in elements of pharmacology and teaching drug education.
2. Training teachers in developmental psychology and facilitation of moral dilemma group discussions.
3. Providing for a three-year follow-up of experimental and control subjects to determine drug-related behaviors.

The principal research question is to determine whether a broad-gauge intervention program can effect any change at all in students' behavior vis-a-vis drugs, beyond the most common alternative used in public schools. If the total intervention effort does turn out to have demonstrable advantages, an extended research effort can be considered in which the contributions of the various components are examined separately.

Since the criterion for success of the program is drug-related behavior of students, the study must necessarily be longitudinal. Our intent is to follow students over at least three years, by which time they will have completed the ninth grade, roughly ages 14-16. Some research has shown that the majority of major drug problems will have surfaced by that age. It is possible to make estimates of effectiveness before the follow-up is complete by assessing students' attitudes and decision-making skills. The relationship of such interim measures to the ultimate behavioral criterion will initially be hypothetical, but by the end of the study, there will be evidence on their predictive validity.

The outcome of the study will thus be twofold: 1) the efficacy of an intervention program will be assessed, leading either to adoption or adaption by other school districts, or to investigation along other directions, and 2) the reliability and predictive validity of short-term

measures will be assessed, leading either to adoption or adaption by other researchers, or to proper skepticism of research results based on such measures.

The research will attempt to answer these specific questions:

1. In a replication of the pilot year design, can the moral development level of sixth grade students be raised?
2. Is the experimental curriculum consisting of creative drug education content, student research projects and teacher facilitated moral dilemma discussion groups a more powerful stimulus for content mastery and stage growth than a standard publisher curriculum?
3. How is stage of moral development related to student's subsequent drug-related behavior?

This research may be of value in at least three different ways: 1) We hope to demonstrate a correlation between moral stage of development and extent of drug use. This relationship may shed light on a number of other variables. 2) In addition, this research project may actually lead to a decrease in drug abuse among members of the treatment group. If this is found, 3) the curriculum itself and the training procedures concomitant with it can easily be replicated on a wide scale.

Drug Abuse Research and Evaluation Consortium

Jointly sponsored by: Drug Information and Education Program, School of Public Health, College of Education, College of Pharmacy, Health Professionals Drug Abuse Education Project, Department of Social, Psychological and Philosophical Foundations of Education (University of Minnesota), Center for Education Research (University of Minnesota), Metro Drug Awareness (Minneapolis Health Department), Drug Information Center (University of Minnesota, Morris), and Drug Education Program (University of Minnesota, Duluth).

During the past two years, faculty at the Duluth, Morris, St. Paul and Minneapolis campuses have, alone and in combination, provided research and evaluation expertise to the University and the state citizenry in the area of drug misuse. A proposal is presently before the Minnesota State Alcohol and Drug Abuse Authority to provide an intercampus repository of evaluation expertise and to develop formative evaluation instruments in response to manifestation of need from the Drug Authority. An example of one way in which this consortium may function is set forth below.

At the present time, a number of drug education programs in the Minneapolis area share similar objectives. Some of these shared objectives are:

1. To increase learner knowledge of drug use and drug use problems.

2. To promote the development of "nonjudgmental stances" toward individuals with drug problems, permitting such individuals greater access to treatment and other health care.
3. To increase participation in community-based projects directed toward the elimination of drug use problems.
4. To provide experiences through which the learner can gain new skills which will facilitate participation in the above.

Accordingly, a cooperative plan was developed whereby each of the University-based drug education programs contributed money, skills and/or person-power to a common Evaluation Consortium (hereafter, EC). Specifically, the Health Professionals Drug Abuse Education Project (hereafter, HPDAEP) [funded by NIMH] contributes evaluation instruments, "time" which has been purchased through HPDAEP funding, and a small test population of practicing health and helping professionals. In return, the HPDAEP group is able to test the validity and reliability of their instruments and the validity of their educational strategies with larger populations through the EC (e.g., see description of "HPDAEP for Students Program", page 29). Additional person-hours purchased or supplied by the EC can be given to HPDAEP to compensate for hours spent by their evaluator working with the EC.

The Public Health Drug Counselling Program (PHDCP) [funded by NIMH] contributes man-hours and expertise to the EC through time purchased from James Boen, Associate Professor of Biometry at the University, in addition to some limited consultation monies. The PHDCP also contributes test populations of health and helping professionals already working in the field of chemical dependency. In return, the PHDCP receives evaluation instruments and expertise in educational planning from the EC.

The Public Health Education course offered by the School of Public Health also provides a test population of education students. In return, they receive evaluative instruments and educational planning from the EC.

The Drug Information and Education Program at the University contributes monies to be used to purchase evaluative expertise from the Department of Social, Psychological and Philosophical Foundations of Education, and from the Center for Educational Development at the University of Minnesota. Monies are also contributed toward the purchase of processing personnel and costs.

In addition to the above mentioned University programs, the Minneapolis Health Department, Drug Awareness Unit contributes test populations of parents, clergy, teachers and others, as well as monies for use by the EC. In return, they receive evaluative instruments and program planning expertise.

Establishment and Elimination of Oral Drug Dependence

Travis I. Thompson

The purpose of the proposed research is to investigate several key factors thought to be involved in the acquisition of drugs as oral reinforcers and the weakening of oral drug reinforcers in rats.

Funding: NIMH, \$310,511.

Ethanol Self-Administration by Animals

Travis I. Thompson

The overall objective of the research is the investigation of variables that influence the development, maintenance and elimination of ethanol as a reinforcer for rhesus monkeys. Ethanol serves as a reinforcer when it is consumed at levels that exceed intake of its vehicle liquid, which is usually water. The variables affecting ethanol intake may be divided into three classes: 1) Past history (e.g., prior experience self-administering other drugs), 2) Current circumstances (e.g., presence of the odor of ethanol), and 3) Reponse consequences (e.g., volume per reinforcement).

Funding: NIMH, \$227,550.

Pending Research Proposals

Family Treatment of Alcoholism

Amount Requested: \$198,000 — Agency: NIAAA

Drug Use Patterns and Social Competencies

Amount Requested: \$982,000 — Agency: NIDA

Chemical Dependency Coordinator — Health Service/Student Counseling

Amount Requested: \$20,479 — Agency: MN Alcohol and Drug Abuse Authority

Evaluation Consortium

Amount Requested: \$750,000-1,000,000 — Agency: MN Alcohol and Drug Abuse Authority

Research Award Turned Back

In June, 1974, the National Institute of Drug Abuse awarded a grant entitled "Cognitive Dissonance Effects on Drug Attitudes" to the College of Education, Twin Cities Campus. After notification of the award, the Drug Information and Education Program conducted a University and community review of the impact of the intended research and a determination was made that the objectives of the proposal were not relevant to current needs. Accordingly, the award was declined by the University.



Twin Cities Campus

Community-University Coordinator

Jimmy H. Evans

A new faculty member, appointed to the faculty in the School of Public Health and officing with the Drug Information and Education staff, has primary responsibility of maintaining and developing community input of needs to the University so that appropriate inter-departmental responses can be developed.

Drug Information Service Center (DISC)

As a specialized drug abuse resource library, DISC has compiled over 500 books and 2000 articles and maintains subscriptions to relevant newsletters and journals. New literature is constantly being evaluated and research is ongoing to insure that up-to-date and relevant information is available.

The catalog of DISC was computerized and an updated catalog has been distributed to each of the state college and University campuses as well as numerous Area Mental Health and state agencies involved in combating drug misuse.

Additionally, two newsletters, one directed toward "Treatment" and one toward "Education" are distributed monthly to each Area Mental Health Board, each public school and persons involved in treatment and education who have been identified by DISC and/or other state agencies.

DISC has recently moved from N620 Elliott Hall to 48 Appleby Hall (the Pharmacy building) and is beginning to integrate its services with those of the Drug Information-Community Drug Education Program. DISC is open to University students and to the community during regular working hours and by appointment.

The Drug Information-Community Drug Education Program (DI-CDEP)

The College of Pharmacy Drug Information-Community Drug Education Program provides services in these primary categories:

1. Drug Information: Printed materials, visuals, and other resources

materials, as well as over-the-phone or through-the-mails question answering, are available.

2. Community Drug Education: Pharmacy students, as well as other health sciences, law and social sciences students, educated through the Drugs and Society course (see page 8) to communicate with elementary and secondary students and adult groups about drugs and related issues (the law, overdose aid, etc.). Teams of these students, or individual students are dispatched to give presentations about drugs and to lead discussions when requested. The usual format is a short presentation followed by values clarification exercises, group discussions, and the answering of questions. Approximately three presentations about drug problems are given by students to local elementary, junior and senior high school students, as well as other community groups, each week.

Throughout the school year the College of Pharmacy, through its DI-CDEP staff, sponsors short educational programs relating to drug use and drug problems for health science students and existing professionals. There are, on an average, one of these per University quarter. The most recent have included Overdose Aid Seminars, implemented with the help of staff members from the Health Professionals Drug Abuse Education Project.

A variety of patterns of community involvement are available through the DI-CDEP. These include the following:

1. Alcohol Education Project (p. 17)
2. Overdose Aid Education Project (p. 17)
3. Communications Skills Seminar (p. 20)

College of Pharmacy faculty and students currently serve as a back-up resource for Metro Drug Awareness Street Drug Analysis Program, analyzing ethical products which have come from Mexico, and unknown organic substances. The College has now obtained a permit for Schedule I substances, and the students and staff hope to expand their ability to serve as a resource for Metro Drug Awareness.

Following successful completion of the Drugs and Society course (see p. 8) a number of students have become involved in street agencies, hot-lines, and free clinics on a continuing basis. These students participate on crisis intervention teams at drop-in centers, rock concerts, and in emergency rooms; others practice their disciplinary skills, promoting community health in free clinics and V.D.-family planning clinics.

Over the past three years, the DI-CDEP services have evolved from a primary focus on one-shot drug education presentations, through a period of experimentation and development of innovative on-going programs, into the current emphasis upon implementation and evaluation of these innovative programs. The DI-CDEP continues to provide single presentations when requested, but increasingly these are provided within the context of an ongoing drug

education program developed by individuals in the community or in schools.

Community-University Projects

Hazelden Research Consultants
Kaye Wildasin, Virginia Newcome

This project offers research project assistance and consultations and is available to community people and students. Specialization is on information regarding alcohol and related problems and includes the following:

1. Research library file I, "The Chemically Dependent Woman," contains over 300 published articles that are available for reference.
2. Research library file II, "An Historical and Contemporary Accumulation of Follow Up Evaluative Studies of Alcoholism Treatment Programs," contains over 400 articles and research papers available for reference.
3. Access to CAAAL, the Classified Abstract Archives on Alcohol Literature, consisting of over 15,000 abstracts of studies on alcohol.

Extensive computer assisted bibliographic information is available for the two files.

Teen Age Health Consultants
Kay Gudmestad, Coordinator

The Teen Age Health Consultants (TAHC) program is designed to provide 12 to 20 year olds with accurate and nonjudgmental health information. This goal is accomplished by training teenagers to function in their communities as peer resource persons.

Recruitment of program participants occurs primarily within the school system. Generalized health information and specific action-oriented seminars are conducted by appropriate community resources. Once the training is complete, the TAHC participants are encouraged to design and implement projects which will provide education, referral and advocacy services to other young people.

Funding: DIEP, \$4200.

Health Professionals Drug Abuse Education Project (HPDAEP)

The Project is funded by the National Institute on Drug Abuse and sponsored by Health Sciences Continuing Education at the University of Minnesota. The Project offers various training and educational programs in the area of chemical dependency. The target audience is practicing health professionals from Minnesota, Iowa, North and South Dakota and western Wisconsin. The major project goals are:

1. Encouraging a more responsive attitude toward drug users and abusers.

2. Teaching basic skills for the diagnosis and referral of chemical dependency problems.
3. Promoting change in the health professional's family, practice setting and respective communities.
4. Promoting interdisciplinary involvement and cooperation.

A general seminar has been developed to try to accomplish the project goals. The seminar objectives are to assist the participants in:

1. Becoming aware of how their attitudes toward drug users and drug abusers affect the health care they provide to clients with drug-related problems.
2. Developing an understanding of the chemically dependent person.
3. Becoming aware of how they as health professionals can better provide care for clients with drug-related problems.
4. Discovering methods of obtaining information concerning their client's drug taking behavior that will have a direct effect on treatment-referral options.
5. Understanding some of the information and training resources that are available to them beyond the general seminar.

Speciality seminars can be requested in order to present a comprehensive approach to specific problem areas. Additionally, traineeships are available in order to provide clinical experiences to those who attend a general seminar.

HPDAEP, in cooperation with the Drug Information and Education Program, presented, on a pilot basis, the program which was developed for practicing health professionals to students and faculty in the Health Sciences at the University of Minnesota, Twin Cities campus. This program, held in December, 1974, was in all probability the first interdisciplinary drug abuse program for students and faculty offered anywhere in the country.

In March of 1975 the workshop will be offered at the request of an entire community, Crow Wing county, in northern Minnesota. Civic leaders, law officers, parents, health professionals, educators, etc., will be in attendance.

The Project is currently cooperating with the development of a model training workshop for the school system in the State of Minnesota. HPDAEP, in cooperation with Drug Education for Youth and Metro Drug Awareness, will be implementing the pilot workshop in Spring of 1975.

Minnesota Medical Information Service
Roger Schroeder, Director

There are four components to this statewide service, all of which are located in the Pharmacy Department at the University Hospital.

Over 2,000 informational requests are handled each month by this source. 5% of which come from lay persons. The components services are:

1. Dial Access — A telephone tape service which serves primarily as a continuing education service for health professionals.
2. Medical-Dental Service — Outstate health professionals have access to University Consultant expertise via telephone conferences.
3. Drug Information Center — Most lay requests for information come through this center which serves primarily as a backup resource for numerous street agencies and health professionals giving specific help in identification of drugs and their effects.
4. Bio-Med Library — Requests for specific references, journals, etc. are processed through this component which has computer access to the Bio-Medical Library at the University.

Office for Student Affairs

University Health Service and Student Counseling Bureau have a combined staff of more than 50 physicians, psychologists, psychiatrists, and social workers delivering direct services to students. A Health Service psychiatrist, Janet Hoveland, and a Counseling Bureau psychologist, Rodney Loper, are working together to structure and implement a specific service program for chemically dependent students. Current program consists of evaluation and referral to community agencies.

Programmatic decisions on the use of drug abuse funds on these campuses are made by the administration and faculty on these campuses in close cooperation with the Drug Information and Education Program.

Coordinate Campus Activities

Duluth

Frank Guldbrandsen, Assistant Professor, Secondary Education
Charles L. Frederick, Assistant Professor, Secondary Education,
Coordinator, Drug Education-Information Program

1. Educational and Informational. Training programs in Drug Abuse Education for:
 - a. pre-service (teachers in training)
 - b. in-service (teachers in schools)
 - c. medical students
 - d. social work students
 - e. counselor students
 - f. community professionals and paraprofessionals
2. Cooperative drug abuse prevention information and education programs within the University components of: Student Personnel Service, Medical School, Social Work School, and Department of Education and Psychology.
3. Maintenance of DIRRS Centers (Drug Information Resources and Referral System).
4. The training and supervision of campus ombudsmen or student advocates to provide for anti-abuse programs and drug first aid and crisis intervention counseling.
5. The development of an analysis anonymous program to analyze street drugs. This was done in cooperation between the UMD Drug Center and the St. Louis County Health Department.
6. The maintenance and expansion of research into the patterns of use and abuse of chemicals in the schools.
7. The development of evaluation techniques for drug abuse education programs.
8. The development of a comprehensive University-public school-community drug abuse education vehicle.

The UMD Drug Education-Information Program is in the early stages of needs assessment and program development. By the end of the 1974-75 academic year, a comprehensive plan will exist.

Morris

Gordon Bopp, Academic Dean
Gary Buer, Instructor
Kevin Flicker, Coordinator, Morris Drug Information Center

Morris Drug Information Center (MDIC)

The Morris Drug Information Center, a part of the University of Minnesota's Drug Information and Education Program, serves as a resource center for a number of drug-related services. While MDIC serves primarily the student population at the University of Minnesota, Morris, requests for services from all areas of the state are considered, and have to date encompassed a wide geographical area. Specifically, MDIC provides the following services:

1. A drop-in drug resource library filled with approximately 200 volumes which may be borrowed. Relevant articles, handouts, and pamphlets are available. MDIC also maintains subscriptions to various drug-related newsletters and journals. Literature is constantly updated and evaluated for accuracy and objectivity. A supply of audiovisual materials concerning drug use and abuse is also available.
2. Short term counseling and possible referral service for people having chemical dependency problems. Attempts are made by MDIC staff to personally visit and consequently establish communication with local chemical dependency treatment centers, detoxification centers, mental health centers, and sobriety groups, in order to give knowledgeable and appropriate referral recommendations to those in need. In addition, MDIC staff are trained in drug first aid techniques in the event of a chemically induced emergency.
3. Assistance with concerned drug education programs and workshops at all educational levels: adult, college, secondary, and elementary. Assistance may include consultation and advice in designing and implementing a drug education program, speaking engagements by MDIC staff, or the loan of informational materials (books, handouts, audiovisual materials).

COURSE ACTIVITY

PE 1710. Drug Use and Abuse. Buer

Large group lecture and small group discussions are used to help the student better understand drug use and abuse and his relationship — as an individual and as one working with young people — to the drug scene. Successful completion of this course will result in an individual who has knowledge of drug use and abuse, who is aware of the risks involved with drug usage and who has developed a fundamental valuing process to assist him in making responsible decisions regarding the usage of all drugs.

Rochester Center

DEWS — Dependency Early Warning System

Mary Adams Martin, Director

Jerry Herber, Coordinator of Student Planning

A program aimed at education to and identification of chemical problems. The program's objective is to respond at an early stage to the needs of chemically involved persons and to do so without disruption of employment.

The goal of DEWS is to help chemically involved persons and their families develop a meaningful and productive way of living in a drug-oriented society by:

1. examining their current attitude toward the use of chemicals;
2. helping them assess realistically the gravity of the present chemical problem in which they are involved;
3. alerting them to the predictability of the progress of the disease of chemical dependency;
4. working with them in the development of an ongoing program of self-assessment;
5. referring them — when indicated — to appropriate community resources for followup help.

Co-Sponsored by Zumbro Valley Mental Health Center, Rochester State Hospital.

Funded by the Minnesota State Alcohol and Drug Authority.

COURSE ACTIVITIES

The credit courses are:

Human Services Generalist/Chemical Dependency I-II (GC-3071-2)
16 credit course from General College, University of Minnesota for persons working in direct client care or aspiring to do so.

Addict: (Alcohol and Drug Dependency In-Service Career Training) (GC-3075) — Training for Detoxification Center Personnel: Six-day intensive course to train persons employed in Detoxification Centers. 3 credits from General College, University of Minnesota. Funded by Minnesota Authority on Alcohol and Drug Abuse.

The non-credit courses are:

CECCA (Community Education: Concepts of Chemical Abuse) — Designed primarily as part of a diversion program from Olmsted County Court in which persons charged with alcohol related offenses are sent to treatment or educational programs. Funded by Rochester Foundation.

DEWS (Dependency Early Warning System) — Night nonresidential educational experience designed for early intervention in Chemical Dependency of the employed person and his spouse.

In-Service Personnel Training Seminar — Twelve day training sessions for the Department of Public Welfare for providing experimental based instruction for persons working in Alcohol units and Drug units at State Hospitals.

Appendix D

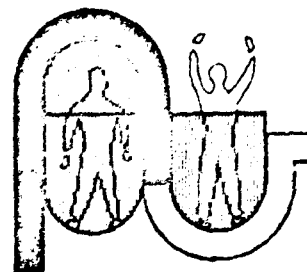
-- AN INTRODUCTION TO
PHARMASYST

College of Pharmacy

An Introduction to

PharmaSYST

Center for the Study of
Pharmaceutical SYSTEMS



PharmaSYST

318 Harvard Street South East
Minneapolis, Minnesota 55455

Phone: (612) 376-3192

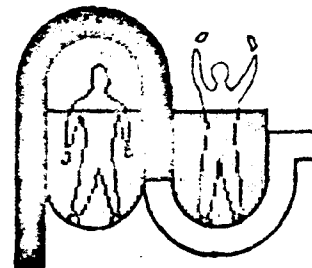
BACKGROUND

The importance of the era of individual research is waning. Its place have grown groups of talented researchers to reflect the multi and interdisciplinary nature of the world about us. Such organizations permit the creation of a critical mass of people resources and ideas that in time generate advancements in a field or discipline. With proper organization and direction these organizations may become very successful in securing grants and other support and, in time, due to their ability and high quality work are sought out by others who desire their various services.

There are numerous beneficial spinoffs for the associated institutions including an increase in academic mass, greater resources than those available through legislative support, graduate student support and a steady flow of outside thought.

PURPOSE

The Center for the Study of Pharmaceutical Systems, PharmaSYST, is devoted to the study of the provision, utilization, delivery and outcome of pharmaceutical and all other health care services. An interdisciplinary group of people having special experience in basic qualitative research skills has been assembled to study the planning, management and evaluation of health care services. The mission of the Center will be to strive toward the development, testing and dissemination of information relating to the provision of the highest quality optimally accessible and least cost health care services with particular attention paid to pharmaceutical services. The objects of study are seen as pharmacy and its associated disciplines, interests and related functions and equally, drugs, in the many perspectives in which they are prescribed, used, and transferred, as well as the provision, need, assess-



ment and analysis of all health care services. Such interest includes attitudinal matters from the point of focus of the prescriber, organizer, government payer and the manufacturer, seller, and patient, including also economic and other social science perspectives. The Center will seek its own support, contract to produce instructional resources and act as a broker to package appropriate mixes of administrative, economic, educational, behavioral, biological and physical scientists to undertake the conduct of its endeavors.

ORGANIZATIONAL RELATIONSHIPS

The Center is associated with the College of Pharmacy, University of Minnesota. It will be independent of any departmental structure and be responsible to the Dean of the College of Pharmacy and accountable to its policy making body, the Principals.

INTERNAL ORGANIZATION

The Center (PharmaSYST) in full bloom will utilize three types of personnel.

These are:

1. Full time and part-time employed staff
2. Principals
3. Associates

1. *Staff* — it is necessary to maintain a minimal core of personnel who will be primarily responsible to PharmaSYST and whose duty it will be to perform the day-to-day operations of the Center, to provide continuity and liaison between and among principals, associates and work groups and clients, etc., project development, marketing, secretarial, clerical, financial management, bookkeeping and technical support functions.

PharmaSYST

a. *Manager* – The office manager handles routine mechanical matters, program planning, graphics, bookkeeping and clerical type functions. This person would perform administrative duties and supervise other staff.

b. *Secretary/Receptionist* – would cover the telephones, greet guests, clients, visitors, arrange programs, travel, handle routine correspondence, publication requests, inquiries, handle duplicating, typing, filing and other office tasks.

c. *Executive Director* – is a known researcher and person capable of serving the public relations needs of PharmaSYST. The Executive Director would be expected to be visible, travel and command the respect of researchers, educators, colleagues and potential clients. He must be able to raise money, sell and have organizational skills.

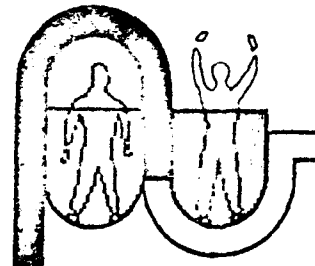
d. *Research Project Development Assistant* – takes concepts and carries them into completed contract and grant proposals with the aid of other staff.

e. *Statistician* – development of study design, analysis of data and evaluation work for proposals and ongoing studies.

f. *Programmer, EDP Coordinator*

g. *Psychologist or Sociologist*

2. *Principals* – The Principals will comprise the policy authority for PharmaSYST. They will consist of 11-13 people appointed for three year terms from the College of Pharmacy, University of Minnesota, the Pharmacy world and related areas such as Health Planning, Public Health, and the public. Initially the Dean of the College of Pharmacy will invite participation. Following the initial cycle the Principals will nominate and invite replacements

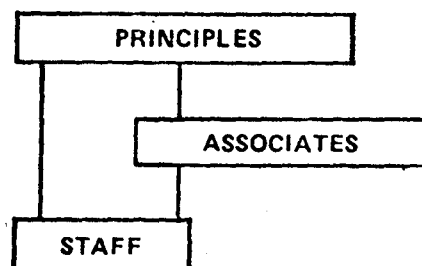


to fill the Principal vacancies. Suggestions will be sought from staff and associates. The staff will be responsible through the Manager to the Principals. The Dean of the College of Pharmacy will chair the Principals.

3. *Associates* – Members of the University of Minnesota, Macalester, Hamline, Augsburg and other College and University faculties, employees of health planning, service and regulatory enforcement organizations would be invited to join the Center as associates. These scholars would lend their names and support to the Center and engage in work on interdisciplinary teams (for payment) when projects require their particular skill and experience. It is anticipated that unique study teams would be created and tailor-made for each project. Disciplines to be represented include:

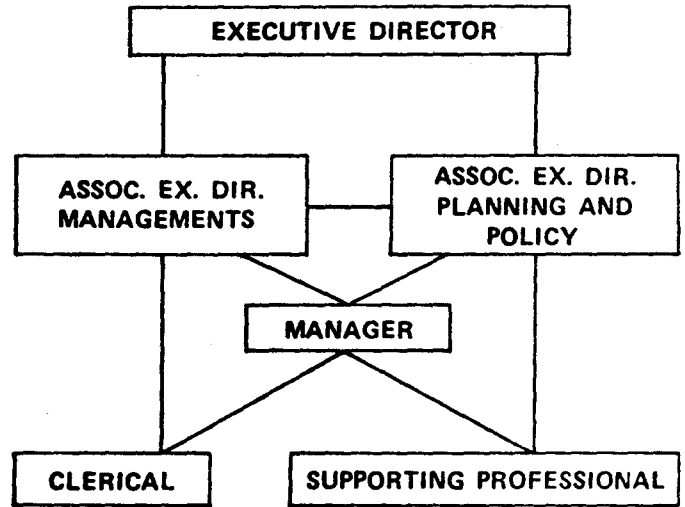
- | | |
|-------------------|---------------------|
| Accounting | Mathematics |
| Anthropology | Med. Chem. |
| Biomed. Computing | Med. Sociology |
| Clinical Pharmacy | Medicine |
| Drug Abuse | Pharmaceutics |
| Economics | Pharmacognosy |
| Education | Pharmacology |
| Epidemiology | Pharmacy |
| Evaluation | Pharm. Admin. |
| Family Studies | Philosophy |
| Finance | Planning |
| Hlth. Care Admin. | Psychology |
| Hlth. Ecology | Public Admin. |
| Hosp. Admin. | Public Health |
| Hosp. Pharmacy | Public Health Educ. |
| Law | Social Psychology |
| Management | Sociology |
| Marketing | Statistics |

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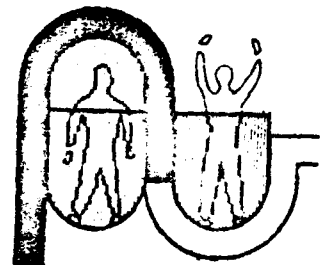
PharmaSYST

- a. *Principals* – Dean as permanent chairman, election from within for vice chairman and secretary.
- b. *Associates* – Principals will designate one person per discipline as Senior Associate.
- c. *Staff*



ACTIVITIES

- Conduct research on the basic applied levels, sponsored by outside agencies and firms, and unsponsored where related to College or Center needs and interests.
- Perform work pursuant to contracts in the health care organization, financing, evaluation, feasibility study and demonstration areas.
- Accept subcontracted portions of work from others where the work is in the purview of Center skill and experience.



– Submit unsolicited proposals for needed and desirable research endeavors, to agencies, government, firms.

– Conduct national symposia, conference and otherwise act as a vehicle for the coordination of studies in the area and agent for the dissemination of findings. Invitational conferences and workshops would be expected to be held.

– Production of a Publication Series of original papers such as monographs, pertinent dissertations, reprints, occasional reports and study final reports.

– Aid in educational endeavors and activities of the University of Pharmacy in particular.

– Provide consulting and management services as appropriate.

– Sponsorship of sabbatical fellowships, visiting professorships and postdoctoral fellowships for researchers in the pertinent areas of study to join the Minneapolis groups.

Further Information

is available and inquiries are invited. Please write:

PharmaSYST
College of Pharmacy
University of Minnesota
Minneapolis, Minnesota 55455

PharmaSYST