

1914

Old School Catalog 1914-15, The Department of Pharmacy

Valparaiso University

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VALPARAISO UNIVERSITY

ANNUAL ANNOUNCEMENT

**VALPARAISO
UNIVERSITY**

**Department
of Pharmacy**

=====
**TWENTY-SECOND
YEAR**

=====
1914-1915

VALPARAISO, INDIANA

How to Reach Valparaiso

Valparaiso is 44 miles east of Chicago on the Grand Trunk, the Pittsburg, Ft. Wayne and Chicago (Pennsylvania Lines), and the New York, Chicago and St. Louis (Nickel Plate) Railroads. It is easily reached from all points. Going westward, these roads make connection at Chicago with all lines leading into the city. Going eastward, the Pittsburg, Ft. Wayne & Chicago Railway makes connections at Plymouth with the Lake Erie & Western Railway (Natural Gas Route), and the Vandalia Line. These make connections with all roads leading into Indianapolis. Further eastward the Pittsburg, Ft. Wayne & Chicago Railway makes connections with all north and south lines. Going eastward the Grand Trunk Railway makes connections at Wellsboro with the Baltimore & Ohio and the Chicago & West Michigan Railway, at South Bend with the Lake Shore & Michigan Southern, and with all north and south lines in Michigan. Going eastward the New York, Chicago & St. Louis Railway makes connections with all north and south lines. The Chicago, Indianapolis & Louisville Railway (Monon Route), running the entire length of the State from north to south, also from Indianapolis, makes connection at Hammond with the New York, Chicago & St. Louis Railway. At Grand Crossing, nine miles east of Chicago, the Pittsburg, Ft. Wayne & Chicago and the New York, Chicago & St. Louis Railways make connection with the Big Four (Cleveland, Cincinnati, Chicago & St. Louis) Railway. Interurban lines also connect with Gary, South Chicago, Hammond, Michigan City, LaPorte and other cities of Northern Indiana.

TWENTY-SECOND
ANNUAL ANNOUNCEMENT

Valparaiso University
Department of Pharmacy

1914-1915

VALPARAISO, INDIANA

INDEX

	Page
Admission Requirements	23
Advantages	23
Athletics and Sports	7
Band and Orchestra	8
Board and Rooms	44
Calendar	4
Courses of Instruction	16-22
Credits from other Institutions	26
Daily Schedule	18
Degrees Conferred	26
Demand for Graduates	14
Departments	7
Description of Courses	27-43
Employment	16
Entrance Requirements	23
Equipment	9
Examinations	15
Faculty	3 and 8
Fees and Expenses	43-44
Graduate in Pharmacy Course	16
Graduation, Requirements for	14 and 16
History and Growth	5
Holidays	15
Laboratories	9
Library and Museum	11
Location	5
Pharmaceutical Association	13
Pharmacy as a Profession	13
Pharmaceutical Chemist Course	21
Positions Secured	14
Post Graduate Course	22
Register of Students	45-48
Review Courses	22
Societies and Social Life	7
State Board Examinations and Pre-requisite Demands	14
Succession of Studies	17 and 22
Teaching Staff	8
Text Books	15
Trips and Excursions	11
University Year	15

FACULTY

HENRY B. BROWN, A. M.

President of the University.

OLIVER P. KINSEY, A. M.

Vice-President of the University.

GEORGE D. TIMMONS, Ph. C., B. S.

Dean of the Pharmacy Department, and Professor of Chemistry.

EBER H. WISNER, Ph. C., B. S.

Professor of Pharmacy and Materia Medica.

MASON L. WEEMS, A. M.

Professor of Botany and Physiology.

JOHN H. CLOUD, Ph. D.

Professor of Physics.

JACOB PAPISH, A. B.

Professor of Analytical Chemistry.

CHARLES H. DEWITT, M. S.

Professor of Bacteriology.

LEE F. BENNETT, A. M.

Professor of Geology and Mineralogy.

HARRISON N. CARVER, A. M.

Professor of Latin.

JOHN E. ROESSLER, A. M.

Professor of German.

ALPHEUS A. WILLIAMS, A. M.

Professor of Commercial Law and Accounting.

GERALD H. STONER, Ph. G., M. D.

Professor of Therapeutics and Toxicology.

LOUIS W. SAHM, Ph. G.

Professor of Commercial Pharmacy.

MILO J. BOWMAN, A. M., LL. B.

Dean of the Law Department, Professor of Pharmaceutical
Jurisprudence.

CALENDAR

Fall Quarter

September 15, 1914, to December 3rd, 1914.

Organization of classes and assignments made, Tuesday, September 15th.

Thanksgiving Holiday, Thursday, November 26th.

Term Examinations, Saturday, November 28th.

Fall Quarter closes, Thursday, December 3rd, 1914.

Winter Quarter

December 8th, 1914 to February 25th, 1915.

Organization of classes and assignments made, Tuesday, December 8th.

Christmas Holiday, December 25th.

Term examinations, Saturday, February 20th.

Winter Quarter closes, Thursday, February 25, 1915.

Spring Quarter

March 2nd, 1915, to May 20th, 1915.

Organization and assignments, Tuesday, March 2nd.

Finals in Chemistry, Pharmacy, and Materia Medica, May 13th, 14th, and 17th.

Baccalaureate Sermon, Sunday, May 16th.

Class Exhibit, Wednesday, May 19th.

Alumni Banquet, Wednesday evening, May 19th.

Commencement for Graduate in Pharmacy Course, May 20, 1915.

Summer Quarter

May 25th, 1915, to August 12th, 1915.

Organization and assignments, Tuesday, May 25th.

Term examinations, Saturday, August 7th.

Final Examinations, August 9th, 10th, and 11th.

General Alumni Banquet, Thursday, August 12th.

Commencement for Pharmaceutical Chemist Course, Thursday, August 12th, 1915.

VALPARAISO UNIVERSITY

In the fall of 1873 a school was organized in Valparaiso, Indiana, which is now known as Valparaiso University. This Institution has never received financial aid from the State nor a dollar of endowment from any source. It has grown steadily from its inception, and now offers exceptional educational opportunities. The first year's enrollment was thirty-five students. The school year, 1913-14 found nearly six thousand different students regularly enrolled. Its greatest advertisement is the host of satisfied students sent out from its walls, and its greatest asset a grateful alumni.

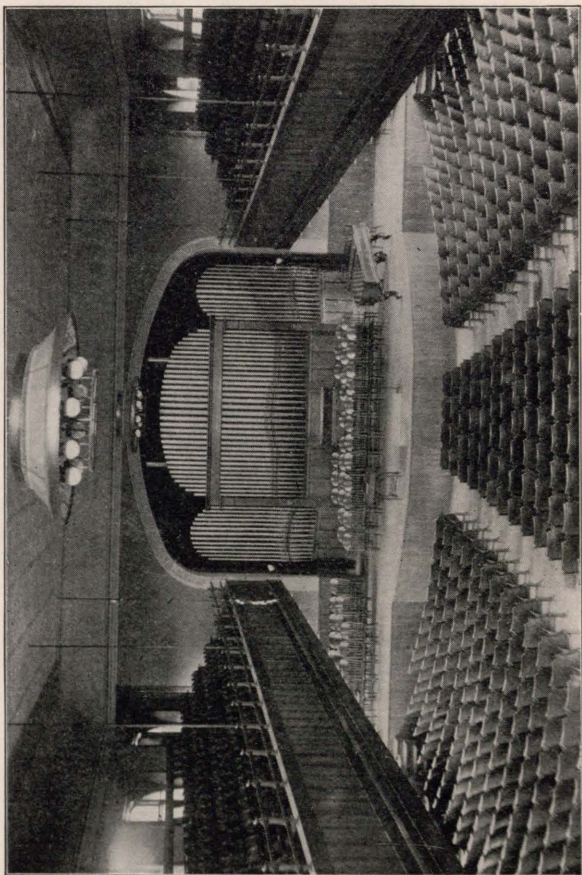
These facts are conclusive evidence of the high merit of the Institution. Steady growth and unparalleled prosperity could not continue for over a third of a century unless the work offered and the equipment furnished were such as to satisfy the real needs of the average student.

Location

Valparaiso is situated in Northern Indiana, about fourteen miles from the southern shore of Lake Michigan. The climate is ideal. Surrounding the little city is a prosperous farming community, while an hour's ride takes one to the metropolis of the west, Chicago. Valparaiso is reached by three railways, the Pennsylvania, the Grand Trunk and the Nickel Plate, and because of the volume of passenger traffic made largely by the University, most through trains stop, thus greatly increasing traveling facilities.

Valparaiso

Valparaiso is a prosperous city of nearly ten thousand people. It has well paved streets, cement walks, a complete sewerage system, both gas and electric lighting plants, interurban street car service, and a water supply doubly safeguarded by an expensive filter plant. Its public school system is a model, and three beautiful city school buildings are supported, in addition to two parochial schools. Eight churches are located within the city limits. A Carnegie Library is now under construction to supplant the present city library.



AUDITORIUM INTERIOR

The University

The material equipment of the University includes more than a dozen large buildings, each constructed and arranged for its special purpose. There are over one hundred regular instructors on the teaching staff, any one of whom can be reached by a member of the student body in need of private assistance in his school work. Even the President and the Vice-President of this University are to be found in the public office and accessible to the humblest student during every hour of the business day. The long established policy of this University is to assist the student in every way possible in quickly finding the work he seeks and for which he is particularly fitted.

Departments

There are now established and in active operation more than a dozen departments. Among these may be mentioned Classic, Scientific, Educational, Law, Medicine, Pharmacy, Dentistry, Engineering, Manual Training, Music, Art, Commercial, Phonography, Domestic Science, etc.

Societies

College Fraternities of all kinds have never existed in the University, and are not only discouraged but barred. State and Sectional societies, for example, the Illinois Society, the Southern Society, the New England Society, the Texas Society, etc., are encouraged, and rooms are furnished at reasonable intervals for their meetings and programs. Many other societies of various kinds exist, among which are the German Society, the International Society, the Catholic Society, and the Scientific Society.

In this connection may be mentioned the Young Men's Christian Association, which occupies its own building, and the Young Women's Christian Association, an active organization which does much to promote the welfare of college women.

Athletics

While the policy of the University has always been opposed to college athletics in the ordinary acceptance of the term, due encouragement is given to such outdoor sports as are not inconsistent with normal college activities. The University Park, in which are found the base ball field, a new quarter mile track and the tennis courts, is situated a few blocks from the campus.

An interdepartment base ball league is maintained, which includes teams from most of the departments.

Sager's Lake, a beautiful body of water located about one-half mile from the University, offers splendid opportunities for rowing and swimming in summer, and for skating in winter.

University Band and Orchestra

A very large Music Department makes it possible to support these organizations. Any one fairly skilled in the use of a musical instrument may become a member and receive, without any expense, training from the director and the practice afforded by frequent rehearsals. Uniforms are furnished, and to a limited extent, band instruments as well, but it is suggested that the student bring with him the musical instrument he desires to use. A college choir and German Maennerchor give to those interested in vocal music, without any additional tuition, most excellent training, amounting in some respects almost to private instruction.

THE DEPARTMENT OF PHARMACY

The Department of Pharmacy graduated its first Class in 1893, and originally offered a fifty weeks' course. This Department has grown with the University as well as with the times, and now offers, and has offered for some years past, a two years' course, the fifty weeks' course having been discontinued in 1908. There is also offered a Pharmaceutical Chemist Course covering two years of forty-eight weeks each. All recitations and laboratory periods are fixed between the hours of 6:30 A. M. and 6:00 P. M. Hours not scheduled for class work during the day, as well as evenings and Saturdays, are at the student's disposal for home study and recreation. The instruction periods are properly apportioned to the three majors, chemistry, pharmacy, and materia medica. How well this is accomplished may be seen by a careful study of the curriculum by hours as shown on pages 18-20.

The Faculty

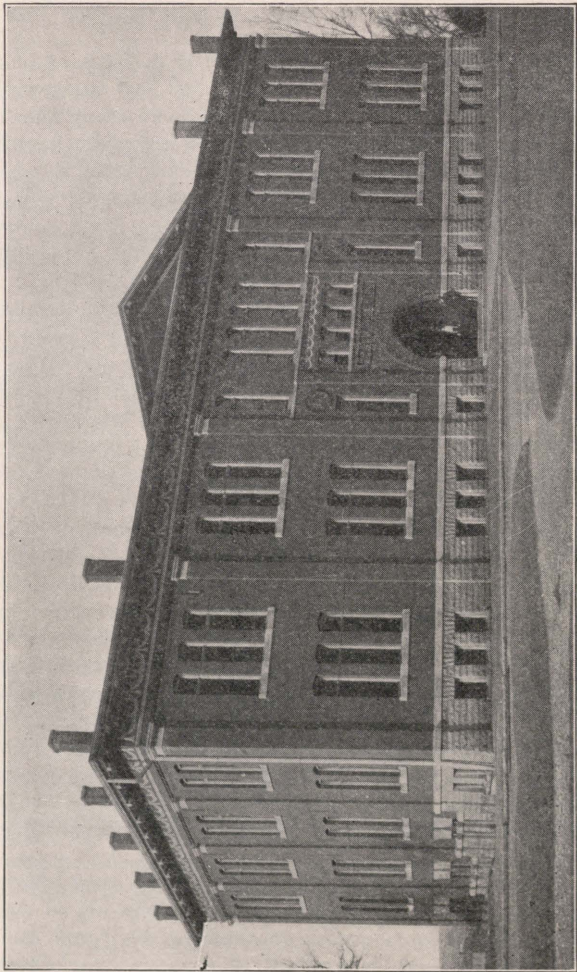
The faculty is made up of regular resident men who make teaching a profession, and not of pharmacists and physicians who make the giving of instruction a secondary matter. However, those teachers having most to do with pharmaceutical training

are registered pharmacists with experience as owners and managers of pharmacies.

Equipment

The Department of Pharmacy is housed in commodious quarters, the building being a substantial brick and stone structure, 60x120 feet, three stories high, heated with steam and lighted by both gas and electricity. It was first occupied in 1902. It contains the various lecture rooms and laboratories in which the pharmacy work is presented, with the exception of botany and physiology. These subjects are taught in the large Auditorium building directly across the street. Convenient accessibility of all class rooms and laboratories must be recognized as a factor, and is here made a prominent feature. The main lecture room for chemistry is 40x60 feet, with raised floor, desk seats for one hundred ninety-two students, black board on all sides of the room, and a well equipped lecture desk, supply and apparatus cases and stereopticon. The main chemical laboratory, 40x60 feet, has capacity for two hundred eighty-eight students working at different hours of the day, no two having to use the same locker or apparatus. The pharmacy laboratory, 40x60, is equipped for two hundred fifty-two students working in different sections, no two using the same apparatus or locker. These rooms have windows in three sides, insuring ample ventilation. The quantitative analytical laboratory accommodates one hundred sixty-two students. Each desk is supplied with gas, running water, and waste trough, thus avoiding numerous trips and unnecessary delay at a general water supply and general waste trough. Convenient to the quantitative laboratory is located the balance room, equipped with sixteen high grade Sartorius and Becker balances, the use of which insures that high degree of accuracy necessary to make practical the work presented. The laboratories are well equipped with hoods so that all noxious gases may be removed.

The dispensing laboratory is equipped with dispensing tables, each with its prescription balance and complete set of shelf bottles. A cabinet extends across one side of the room filled with the regular shelf ware of a retail pharmacy. Each laboratory has its side room or store room immediately adjacent to it, so that the student is not compelled to lose the time necessary for trips to a general store room. The materia medica room is fitted up with individual desks and lockers for pharmacognosy. It



PHARMACY BUILDING

also contains large display cabinets of crude drugs, open to the close inspection of the student at any time. Besides these there are also display cabinets of chemical and pharmaceutical apparatus convenient to all students interested.

On the same floor is a large general museum of especial interest to the student of chemistry and pharmacy because of the collection of minerals contained therein. Special separate laboratories are provided for work in physics, botany, physiology and bacteriology. All these laboratories are adequately equipped with material and apparatus, each of the last three named having separate microscope equipment of the celebrated Bausch and Lomb manufacture. The student body has at its disposal a total of eighty-four high grade microscopes in these laboratories.

The departments of Physics, Chemistry, Botany and Bacteriology have each a stereopticon in their respective lecture rooms.

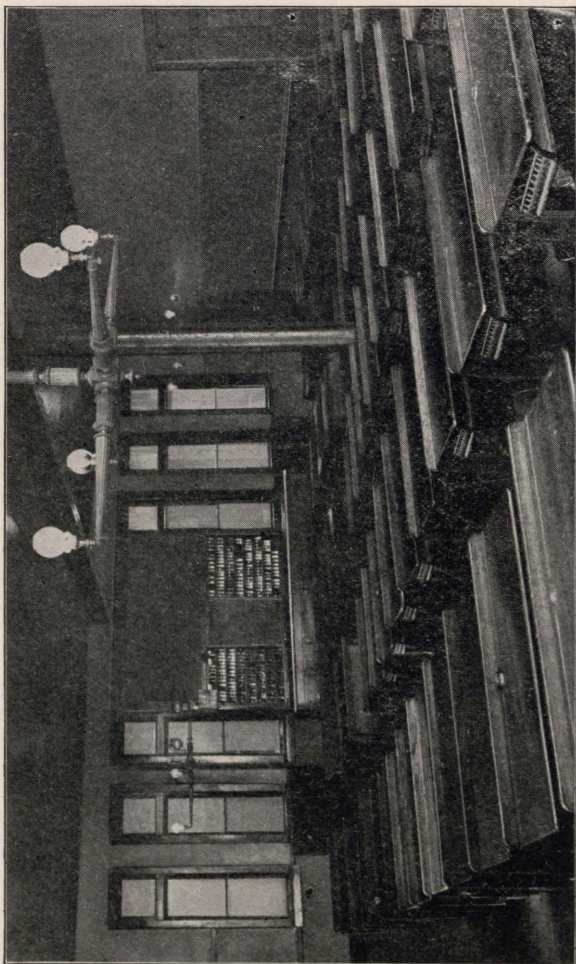
Library and Museum

The general college library of 12,000 books, which includes a well equipped pharmaceutic library, is open to the pharmacy student, as is also the museum. Practically all the pharmacy journals are taken, and these are kept in the pharmacy building at the disposal of students of pharmacy only, and arrangements are made whereby they may be taken out for a limited time for home reading.

The entire equipment of the Carnegie Library is also at the disposal of the student body.

Study Trips

Annual excursions to manufacturing plants, both chemical and pharmaceutical, are arranged for by the faculty and attended at the option of the individual student. In this way practical information is acquired regarding the preparation of chemicals and galenicals upon a commercial basis. Itineraries are so arranged that several plants are visited each trip so that maximum benefit is obtained at minimum expense. Each year a visit is made to the large pharmaceutical laboratories and manufacturing plants of Detroit, Michigan. Proximity to Chicago as well as to the great oil refineries, iron and steel producing plants, cement works, etc., offers special inducement to those interested in th industrial application of their chemistry.



CHEMISTRY LECTURE ROOM

The Pharmaceutical Association

This organization has for its object the promotion of social intercourse as well as the stimulation of professional interest among the students of pharmacy. It is purely a student organization and any student in the department is eligible for membership. The society meets twice monthly, and the programs prepared are always both interesting and instructive. In addition to student programs and lectures by the faculty the Association is addressed during the year by men of prominence in pharmaceutical circles. Among these may be mentioned Professor W. B. Day, president of the American Pharmaceutical Association; Mr. L. E. Warren, chemist in the laboratory of the American Medical Association; Mr. O. V. R. Smith, with Parke, Davis & Co.; Mr. N. S. Amstutz, research engineer; Mr. J. A. Hynes, chief chemist, U. S. Service, Chicago port of entry; Mr. H. E. Barnard, Indiana State Food and Drug Commissioner, and Mr. Hugh Craig and Mr. J. M. Barrett of the National Association of Retail Druggists. Besides these lectures given under the auspices of the Association, general lectures are occasionally delivered by such men as Dr. J. N. Hurty, of the Indiana State Board of Health, Surgeon L. L. Lumsden of the U. S. Public Health Service, and Dr. H. W. Wiley, late chief of the bureau of chemistry.

Pharmacy as a Profession

To young men and women who have not yet made a choice of a vocation, Pharmacy is commended for serious consideration. In these days some discussion is heard of drugless therapy, and prediction is sometimes made that in a short time medicines will no longer be used. If those who make such statements were informed as to the length of time devoted to materia medica and therapeutics in the curriculum of the modern medical college, they would be convinced that the day when drugs will be discarded is indeed far in the future. While it is doubtless true that the abuse of drugs will be discouraged to an even greater extent than at present, it is also true that the intelligent use of carefully prepared and standardized medicinal products will assume a greater importance. The sale of drugs by irresponsible persons such as peddlers and general storekeepers will be restricted or forbidden, leaving this business to properly qualified pharmacists. Remuneration for competent drug clerks is higher

at the present time than ever before. Furthermore, the man working on a salary has an opportunity, if he exerts industry and thrift, of entering business on his own account with every prospect of success. It should be noted also, that while a majority of pharmacy graduates devote themselves to retail pharmacy, there are other opportunities open to them. Among the graduates of the Department of Pharmacy may be found a considerable number who hold positions as traveling salesmen for wholesale drug firms and pharmaceutical manufacturers, chemists in laboratories of manufacturing pharmacists and in other commercial laboratories, chemists in food and drug laboratories, teachers of pharmacy, chemistry, etc. While the department does not obligate itself to secure employment for graduates, the demand by employers for its graduates is usually far in excess of its ability to supply. If the classes were several times as large as at present there would be no difficulty in finding positions for all completing the course.

Necessity for College Training

The Federal Pure Food and Drugs Act together with similar State Food and Drug Laws make demands upon the pharmacist that can be met only by a college trained man. These together with the more stringent pharmacy laws recently enacted in very many of the states, and a general public awakening to the needs of accurate and reliable analytic work are surely signs pointing in but one direction. This condition is being thoroughly recognized by the legislatures of many states, and in some instances there is already a legal demand that the candidate appearing for examination before the state board be a graduate of a college of pharmacy. The satisfaction of anticipating such a condition appeals to every one.

The pharmacist must be more than a mere salesman. He is held responsible for the drugs dispensed by him, and must therefore be qualified to judge of their identity, strength and purity. There already exists a demand, certain to be increased in the near future, for college trained pharmacists. This demand on the part of the public will in time be made universally statutory. While all these requirements and demands upon the pharmacists make it somewhat more difficult to enter the profession, the ambitious person will not allow this to deter him. After he has prepared himself he finds that his professional standing and re-

muneration are greater because of these laws, and further that there is a compensation in the protection of these very laws which at first seemed so exacting.

The University Year

The University year is of four terms of twelve weeks each. This corresponds to the Pharmaceutical Chemist year, which course covers two such years. The Graduate in Pharmacy year includes three terms of twelve weeks each, beginning in September and ending in May. Two such years are required for graduation, with an interim of three months between the junior and senior years.

Each term opens on a Tuesday at 8:30 A. M. By five o'clock all classes are met, organized and lessons assigned, so that regular recitations begin Wednesday and continue during that week, including Saturday. For the following ten weeks classes are held five days a week, with occasional laboratory work given on Saturday. On the eleventh Saturday term examinations are held and on the next Thursday the quarter closes. The succeeding term opens the following Tuesday. The Friday and Monday lost between terms are thus made up on the first and last Saturdays of each term, giving a full twelve weeks of five days a week. Classes are taught from 6:30 in the morning until 6:00 at night. This does not mean that a student necessarily takes either a 6:30 A. M. or 5:00 P. M. class. That is usually optional, as other sections of the same work are almost always obtainable at other periods of the day. The only holidays granted throughout the Pharmacy year are Thanksgiving Day and Christmas Day. It will thus be seen that there is given by this Department an actual number of hours far greater than the usual nine months' course really contains.

Texts

Text books in many instances may be rented. In other cases books may be purchased and sold to succeeding students at prices that leave a net loss practically amounting to rent. The best and latest texts are insisted upon. The books recommended and used are found listed in the description of the various courses.

Student Employment

Where the yearly attendance approximates six thousand different students, it is apparent that many opportunities present themselves to the student who desires to economize. At this institution work is encouraged, and the student who finds any honorable employment to assist in making his way receives as much consideration from classmates and teachers as does the student who has no need to work for his expenses. The University gladly assists deserving students in finding employment.

COURSES OF INSTRUCTION.

Three courses of instruction are offered in the Department of Pharmacy. These are known as the **Graduate in Pharmacy** or **Ph. G. Course**, **Pharmaceutical Chemist** or **Ph. C. Course**, and **Post-Graduate Course**.

The Graduate in Pharmacy Course

This is the most popular course in the Department of Pharmacy because it is one designed to prepare the student for the duties of the retail pharmacist.

While this course is not planned especially for the purpose of fitting students for examination, those who complete it should be able to pass any state board, and are qualified to fill responsible positions.

This course comprises two years of nine months each. The year is divided into three terms of twelve weeks each, with an interim of three months between Junior and Senior years.

The curriculum is so arranged that the subjects pursued will prepare the student for all the studies to be taken up in the succeeding terms, thus preserving logical sequence in the order in which the different subjects in the course in Pharmacy are presented. It is also arranged in conformity to the outline given in the Pharmaceutical Syllabus. However, in every instance there is offered and required a greater number of hours than indicated in the outline given by the National Committee. To a very limited extent students may elect certain branches in other departments of the University in the place of branches in the curriculum. They also have the privilege of taking additional work without extra charge, with the exception of private instruction in music, etc.

Succession of Studies in the Graduate in Pharmacy Course

Junior Year

First Term—Inorganic Chemistry I, Experimental Chemistry, Chemistry Drill, Botany I, Botany Laboratory, Elementary Latin.

Second Term—Inorganic Chemistry II, Arithmetical Chemistry, Analytical Chemistry I, Botany II, Botany Laboratory, Pharmaceutical Latin.

Third Term—Inorganic Chemistry III, Analytical Chemistry II, Physiology, Physiology Laboratory, Pharmaceutical Physics, Physics Laboratory, Commercial Pharmacy.

Senior Year

First Term—Inorganic Chemistry IV, Volumetric Analysis, Theoretical Pharmacy I, Operative Pharmacy I, Materia Medica and Pharmacognosy I, Arithmetical Pharmacy.

Second Term—Organic Chemistry I, Physiological Chemistry, Theoretical Pharmacy II, Operative Pharmacy II, Materia Medica and Pharmacognosy II, Histological Pharmacognosy, Mineralogy.

Third Term—Organic Chemistry II, Alkaloidal Analysis, Theoretical Pharmacy III, Materia Medica III, Dispensing, Commercial Pharmacy II, Bandaging and First Aid, Therapeutics and Toxicology, Pharmaceutical Jurisprudence.

The Graduate Course in Pharmacy by Hours

Branches	Lectures and Recitations Number of Hours	Laboratory and Drills Number of Hours
Chemistry—Inorganic	240	132
Chemistry—Analytical
(Qualitative and Quantitative)		300
Chemistry—Organic	120	...
Chemistry—Physiological		60
Chemistry—Alkaloidal Analysis		60
Botany	120	120
Histological Pharmacognosy		30
Pharmaceutical Physics	60	60
Pharmacy — Theoretical	180	36
Pharmacy — Operative		240
Dispensing		120
Materia Medica and Pharmacognosy	120	60
Physiology	60	36

Mineralogy	30	...
Latin	120	...
Therapeutics and Toxicology	24	...
Commercial Pharmacy	85	...
Bandaging and First Aid	24	...
Pharmaceutical Jurisprudence	12	...
Total	1,195	1,254

Provisional Daily Schedule

Junior Year

First Quarter

6:30			
7:30	Botany I	Daily	60 hrs.
8:30	Chapel Period	"	
9:00			
10:00	Inorganic Chemistry I	"	60 "
11:00	Experimental Chemistry	"	60 "
1:00	Botany Laboratory	"	60 "
2:00			
3:00			
4:00	Latin I	"	60 "
5:00	Chemistry Drill	Mon., Wed., Fri.	36 "
	Lecture and recitation hours per day	3.	
	Laboratory and drill hours per day	2.6	
	Total		5.6

Second Quarter

6:30			
7:30	Botany II	Daily	60 hrs.
8:30	Chapel Period	"	
9:00	Arithmetical Chemistry	Mon., Wed., Fri.	36 "
10:00	Botany Laboratory	"	60 "
11:00			
1:00	Qualitative Analysis	"	} 120 "
2:00	Qualitative Analysis	"	
3:00			
4:00	Inorganic Chemistry II	"	60 "

5:00	Pharmaceutical Latin	Daily	60 hrs.
	Lecture and recitation hours per day	3.	
	Laboratory and drill hours per day	3.6	
		<hr/>	
	Total	6.6	

Third Quarter

6:30			
7:30	Pharmaceutical Physics	Daily	60 hrs.
8:30	Chapel Period	"	
9:00	Inorganic Chemistry III	"	60 "
10:00	Physics Laboratory	"	60 "
11:00	Commercial Pharmacy	"	60 "
1:00	Quantitative Analysis	"	} 120 "
2:00	Quantitative Analysis	"	
3:00	Physiology	"	60 "
4:00	Physiology Laboratory	Mon., Wed., Fri.	36 "
5:00			
	Lecture and recitation hours per day	4.	
	Laboratory and drill hours per day	3.6	
		<hr/>	
	Total	7.6	

Senior Year**First Quarter**

6:30			
7:30	Inorganic Chemistry IV	Daily	60 hrs.
8:30	Chapel Period	"	
9:00	Arithmetical Pharmacy	Mon., Wed., Fri.	36 "
10:00	Theoretical Pharmacy I	"	60 "
11:00	Volumetric Analysis	"	60 "
1:00	Operative Pharmacy I	"	} 120 "
2:00	Operative Pharmacy I	"	
3:00	Materia Medica and Pharmacognosy I	"	60 "
4:00			
5:00			
	Lecture and recitation hours per day	3.	
	Laboratory and drill hours per day	3.6	
		<hr/>	
	Total	6.6	

Second Quarter

6:30			
7:30	Organic Chemistry I	Daily	60 hrs.
8:30	Chapel Period	"	
9:00	Theoretical Pharmacy II	"	60 "
10:00	Mineralogy, and Histological Pharmacognosy	Alternate days	60 "
11:00	Physiological Chemistry, Urinary Analysis, Stomach Contents and Milk Analysis)	Daily	60 "
1:00	Operative Pharmacy II	"	120 "
2:00	Operative Pharmacy II	"	
3:00	Materia Medica and Pharmacognosy II	"	60 "
4:00			
5:00			
	Lecture and recitation hours per day	3.5	
	Laboratory and drill hours per day	3.5	
		<hr/>	
	Total	7.	

Third Quarter

6:30			
7:30	Organic Chemistry II	Daily	60 hrs.
8:30	Chapel Period	"	
9:00			
10:00	Theoretical Pharmacy III	"	60 "
11:00	Alkaloidal Analysis	"	60 "
1:00	Dispensing	"	120 "
2:00	Dispensing	"	
3:00	Materia Medica and Pharmacognosy III	"	60 "
4:00	Therapeutics and Toxicology	Mon., Wed.	24 "
	Bandaging and First Aid	Tue., Thur.	24 "
	Pharmaceutical Jurisprudence	Fri.	12 "
5:00			
	Lecture and recitation hours per day	4.	
	Laboratory and drill hours per day	3.	
		<hr/>	
	Total	7.	

In addition to the above, a series of lectures on Commercial Pharmacy covering twenty-five hours is given throughout the Senior Year, on Tuesdays and Thursdays of every third week, using any available hour that may be convenient.

At the unoccupied hours shown in the schedule, students may take, at their option, any other subjects in other departments in which they may be interested. Many avail themselves of this opportunity, especially during certain terms, carrying German or Mathematics, etc.

Strict adherence to this schedule will be maintained in so far as the number of hours and the arrangement of each quarter's work are concerned. It is provisional only in so far as the hour assigned to each class exercise may be varied. For example, in the first quarter of the Junior year, botany may be taught at 3:00 instead of 7:30, Latin at 9:00 instead of 4:00, etc.

The Pharmaceutical Chemist Course

This course comprises two years of forty-eight weeks each, or ninety-six weeks. Since the demand for pharmacists of broad professional attainments is increasing with each passing year, this course has been arranged to furnish a more thorough training than could possibly be given in the Ph. G. course of seventy-two weeks. Graduates of this course are exceptionally well prepared for all kinds of pharmaceutical and general chemical work. They are especially qualified for the different phases of analytical chemistry which will enable them to fill positions in pharmaceutical laboratories, food laboratories, and in various manufacturing establishments. On the other hand they have obtained, either one of the best foundations possible for a study of medicine, or the educational qualifications necessary to make them sought after as teachers of chemistry.

In addition to the hours given in the Graduate Course as outlined on page 17 the Pharmaceutical Chemist Course presents:

Industrial Chemistry	36	...
Water Analysis		60
Bacteriology	60	60
German	240	...
Gas Analysis	}	120
Ore and Cement Analysis		
Iron and Steel		
Blowpipe Analysis		60
Synthetic Organic Chemistry		120
Foods and Food Analysis		240
Pharmacopoeial Assaying		60
Microscopy		60
Total	1,531	2,034

Succession of Studies in the Pharmaceutical Chemist Course**Junior Year.**

First Term—Inorganic Chemistry I, Experimental Chemistry, Arithmetical Chemistry, Botany I, Botany Laboratory, Elementary Latin, German.

Second Term—Inorganic Chemistry II, Arithmetical Chemistry, Analytical Chemistry I, Botany II, Botany Laboratory, Pharmaceutical Latin, German.

Third Term—Inorganic Chemistry III, Analytical Chemistry II, Physiology, Physiology Laboratory, Pharmaceutical Physics, Physics Laboratory, Commercial Pharmacy.

Fourth Term—Inorganic Chemistry IV, Industrial Chemistry, Volumetric Analysis, Water Analysis, Bacteriology, Bacteriology Laboratory, German.

Senior Year

First Term—Advanced Analysis (including Gas, Ore and Cement, and Iron and Steel), Theoretical Pharmacy I, Operative Pharmacy I, Materia Medica and Pharmacognosy I, Arithmetical Pharmacy, German.

Second Term—Organic Chemistry I, Physiological Chemistry, Theoretical Pharmacy II, Operative Pharmacy II, Materia Medica and Pharmacognosy II, Histological Pharmacognosy, Mineralogy and Blowpipe Analysis.

Third Term—Organic Chemistry II, Alkaloidal Analysis, Theoretical Pharmacy III, Materia Medica III, Dispensing, Commercial Pharmacy II, Bandaging and First Aid, Therapeutics and Toxicology, Pharmaceutical Jurisprudence.

Fourth Term—Synthetic Organics, Foods and Food Analysis, Pharmacopoeial Assay, Microscopy, Thesis.

The Post-Graduate Course

This course comprises one year, of nine months and is made up of work from both the other courses selected to meet the needs of each individual student. This does not imply that the student is to have less than a complete program for each day. He must select, or have selected for him as many hours work per day as are required of the regular pharmacy student.

This makes an excellent review for those who have been out of touch with school work for a time. Because of the fact that

selection of subjects is made with regard to the needs of the student, it makes this course preparatory to board examinations. Non-registered pharmacists may avail themselves of this special course for reviewing those particular subjects in which they have developed least strength, and they may enter any term in the year.

Advantages

The Department of Pharmacy, being located in a small city, is free from the influences which detract from a close attention to study upon the part of the student. Thus more can be accomplished in the same length of time than is accomplished where the student's attention is divided between school work and outside employment and diversions.

It is not considered desirable for students to find employment in stores for any considerable part of their time while pursuing the course.

The practical side of pharmacy is in no way underrated by the department, but it is to the student's best interest to give his undivided attention to his studies while taking the course. Certainly not more than one-half as much can be learned in a school of pharmacy where the time is equally divided between school work and store practice.

It must be understood that here instruction is given five days in the week throughout the entire nine months:

The living expenses in a small city are much lower than in a large city. This makes it possible to take the complete course at much less expense than would be incurred when taken in schools differently situated.

Requirements for Admission

The Educational requirement for admission to the Graduate in Pharmacy Course is a certificate of having completed at least two years of a recognized high school course, or the equivalent, determined by examination. Applicants for admission not able to meet the requirements may enter the course under conditions. These conditions must be removed before entering upon the Senior year. It must be understood that no student is admitted, even under conditions, who has not had at least one year of high school study after eight years of grade preparation, or the full equivalent thereof. To remove these conditions advantage is offered during the pharmacy year of selecting from other depart-



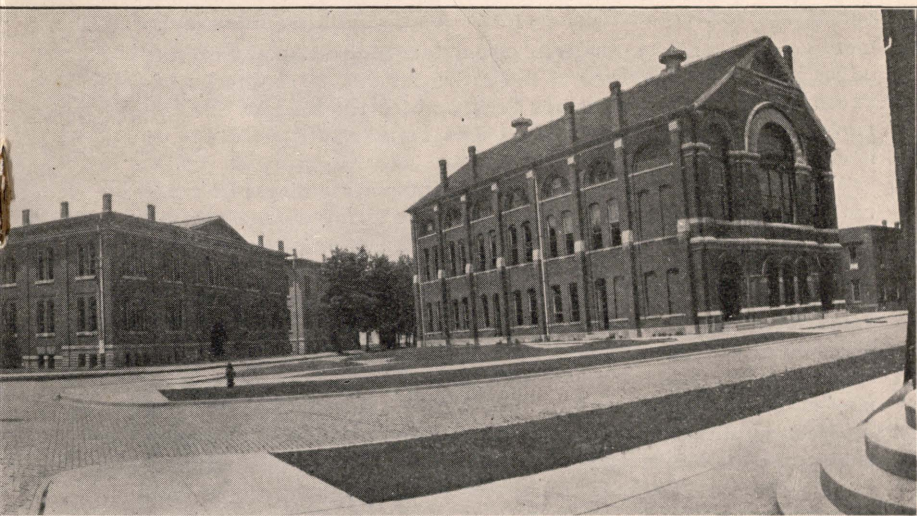
OLD COLLEGE BUILDING

PHARMACY

COLLEGE



SAGER'S LAKE



BUILDING

MEDICAL BUILDING

AUDITORIUM

PLACE



PHARMICS vs. SCIENTIFICS

ments those subjects required without extra tuition. Also the added advantage is offered of the entire summer term interim between Junior and Senior years during which the student may remove any remaining conditions. The regular tuition of \$20.00 is charged for this extra term.

For the Pharmaceutical Chemist Course a certificate of graduation from a recognized high school offering a four years' course, is required, or the equivalent as shown by properly certified credentials.

For the Post-Graduate Course only those may enter as candidates for a degree who have completed a Ph. G. course in this or some other recognized school of pharmacy.

For purposes of review work not leading to a degree anyone may enter, and at any time.

Each applicant for admission to any of the courses must be of good moral character and at least seventeen years of age.

Also each applicant for admission to any of the courses, upon entrance, must present credentials showing his qualifications.

Requirement for Graduation

Candidates for graduation must have met the admission requirements and must have completed all the subjects designated in the course of study with a mark of at least 80%, and with a record of attendance not falling below 80%. Examinations are given at the end of each quarter upon the subjects covered during that term. There are also final examinations in Chemistry, Materia Medica, and Pharmacy which are obligatory, 80% being the minimum passing mark.

Credits will be accepted from other institutions where the admission requirements and the character of the work are equivalent to that offered by this school, but anyone who receives a degree in any of the courses in pharmacy must have attended the full Senior year in this institution.

The degree of Graduate in Pharmacy will be given to those completing the seventy-two weeks course and also to those completing the thirty-six weeks Post-Graduate Course who were eligible for entrance for a degree.

The degree of Pharmaceutical Chemist will be given to those completing the ninety-six weeks course.

A DETAILED DESCRIPTION OF COURSES OFFERED**Inorganic Chemistry I**

An introduction to chemistry is presented, including sufficient of the fundamental theories and laws pertaining thereto necessary to give the beginner a comprehensive grasp of the subject. Descriptive work, including the non-metals only, is presented by lecture and demonstration. Time, one hour per day for twelve weeks, or sixty hours. Text used, Newell's Descriptive Chemistry.

Experimental Chemistry

Laboratory experiments bearing directly upon the class work offered are performed by each student. As much of the quantitative is introduced as possible. This accompanies the preceding course and a credit in that course is made subject to satisfactory work in this one. Time, one hour per day for twelve weeks, or sixty hours. Text, Newell's Laboratory Manual supplemented by instructor's notes.

Chemistry Drill

This is purely a drill class, obligatory to all taking Chemistry I. The time is given to symbol, formula and equation writing, solution of problems, and general quiz work. Time, three hours per week for twelve weeks, or thirty-six hours.

Inorganic Chemistry II

Devoted to the study of theoretical and elementary physical chemistry. There is discussed the atomic theory; equivalent and atomic weights and methods of their determination; valency; electrolysis and the ionic theory; Mendelejeff's law; general properties of gases—Boyle's and Charles' laws; diffusion; liquefaction; kinetic theory; general properties of liquids—vapor density, vapor pressure, freezing point, and boiling point; solution; osmotic pressure; thermo-chemistry; and crystallography. Time, one hour per day for twelve weeks, or sixty hours. Text, Newth's Inorganic, Part I.

Arithmetical Chemistry

Covering practical chemical problems together with problems arranged to emphasize the relations and laws discussed in class. This course accompanies and is essential to the preceding one. No text required. Problems arranged by the instructor. Time, three hours per week for twelve weeks or thirty-six hours.

Analytical Chemistry I

This is a laboratory course in qualitative analysis with lectures and quizzes two hours per week. Systematic and special methods are presented for separating and recognizing all the common metallic and acid radicals. Particular attention is given to the determination of unknowns. Time, two hours per day for twelve weeks or one hundred twenty hours. Text, Newth's Qualitative Analysis.

Inorganic Chemistry III

Resume' of Chemistry I, going into much more detail, with especial attention given to the pharmaceutical and manufacturing applications of this portion of chemistry. A thorough study of all the non-metallic elements, also arsenic, antimony, and bismuth. Time, one hour per day for twelve weeks or sixty hours. Text, Newth, Part II and Part III to Chapter IV.

Analytical Chemistry II

Gravimetric analysis is made the major throughout this term, although the qualitative composition of substances as unknowns is first determined and then the quantitative relationship. Advanced qualitative work including tests for common organic acids is given to fill in all spare time which the necessity of certain gravimetric operations admit. Lectures and quizzes two hours per week. Time, two hours per day for twelve weeks or one hundred twenty hours. Text, Newth's Qualitative and Quantitative Analysis.

Volumetric Analysis

The determinations made by the student in this course embrace acidimetry and alkalimetry, oxidation and reduction, and volumetric precipitation. A considerable number of the Pharmacopoeial assays are made. The student receives a thorough training in preparation of standard solutions. The laboratory work is accompanied by lectures and quizzes. One hour per day for twelve weeks, or sixty hours. Text, Coblenz and Vorisek, or Newth.

Inorganic Chemistry IV

A study of the spectroscope and its applications, careful consideration of all the common metals and their compounds to-

gether with passing notice of rare metals. Special attention given to official substances and to those having pharmaceutic or commercial importance. Radium and radio-activity and its application discussed. Time, one hour per day for twelve weeks or sixty hours. Text, Newth's Inorganic, Part III completed.

Organic Chemistry I

An introduction to organic chemistry, and the aliphatic series covered. Optical activity discussed and the polariscope used. The subject of stereo-isomerism considered and illustrated with models. Experiments suggested by the text and other supplemental thereto performed by the instructor. Time, one hour per day for twelve weeks, or sixty hours. Text, Remsen.

Organic Chemistry II

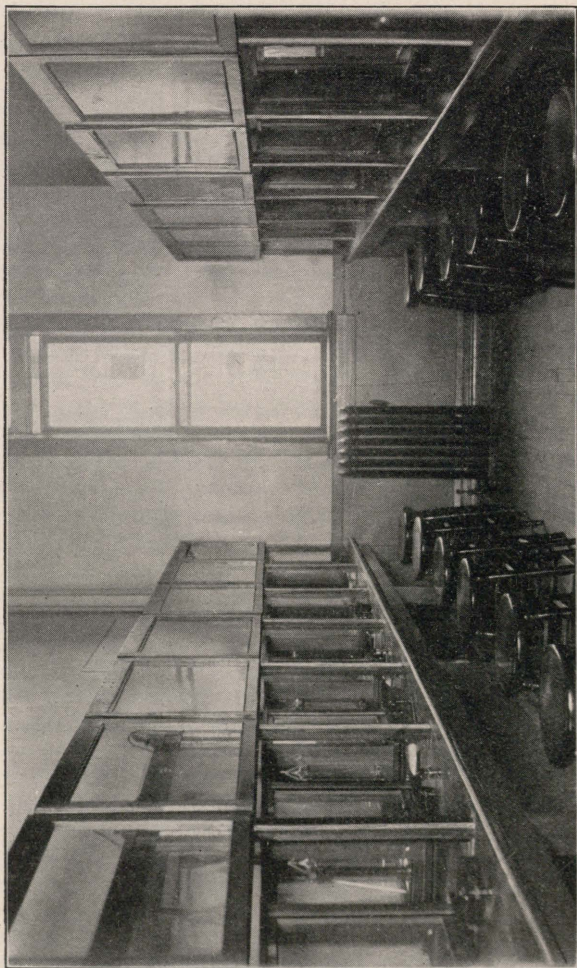
A continuation of Organic I, covering the cyclic series. References made throughout both courses to all official organics as well as drugs or preparations containing them, the text book being constantly supplemented by the pharmacopeia, dispensaries, texts on pharmacy, and materia medica. Experiments by the instructor as in the preceding course. Time, one hour per day for twelve weeks, or sixty hours. Text, Remsen, completed.

Physiological Chemistry

This course covers both a qualitative and quantitative examination of urine, making use of gravimetric and volumetric methods, the centrifuge and microscope; analysis of gastric contents and saliva; and an examination of milk including the detection of preservatives and determination of quantity of fat present. Pamphlet, and notes given by instructor. Saxe, Holland and Simon's Clinical Diagnosis as reference books. No text required. Laboratory work interspersed with lectures and quizzes. Time, one hour per day for twelve weeks, or sixty hours.

Botany I and II

The course in Botany includes a study of the morphology of the seeds, roots, stems, leaves, flowers and fruits, together with the various physiological processes of germination, food absorption, photosynthesis, assimilation, transpiration, respiration, pollination, fertilization and dispersal of plants. Attention is given to the identification, classification and preservation of many of the common medicinal plants. By the study of a series of types representing the various groups of plants the student acquires a



BALANCE ROOM

knowledge of the plant kingdom as a whole, together with the origin and development of each group and the principles and theories of organic evolution. Plant breeding, the economical value of plants, and forestry receive attention. The student is taught the various methods of making and preserving microscopical preparations of plant tissues. Regular laboratory work accompanies lecture and recitations throughout the entire course. Time, one hour per day lecture and recitation for two terms or one hundred twenty hours, and one hour per day laboratory work for the same period, making two hundred forty hours in all. Text, Coulter, Barnes and Cowles with Kraemer, Bastin, Bessey, Vine and others as reference.

Histological Pharmacognosy

This work follows the courses in botany and deals with the microscopical study of drugs. Cells, tissues, hairs, granules, crystals, etc., etc., as they occur in plant parts in section, powder, and precipitate are studied under the microscope. By comparing samples with standards the student is taught to identify the histological elements as an aid to their identification and to the detection of adulterants. No text required. References, Jelliffe, Schneider and Sayre. Time, one hour per day for six weeks, or thirty hours.

Pharmaceutical Physics

This course presents a resume' of elementary physics, and includes motion; inertia; energy; hydrostatics; pneumatics; thermometry; heat effects and heat transference; light reflection, refraction, dispersion and polarization; magnetism and electricity. Throughout the quarter the application of the principles of physics to pharmaceutical problems is made prominent. An accompanying laboratory course is arranged to emphasize those principles introduced during the lecture and recitation periods. Time, five hours per week for lecture, and five hours laboratory for twelve weeks, or one hundred twenty hours in all. Text, Cloud's Principles of Physics.

A careful study of the structure of the cells, tissues, and organs of the human body is followed by a consideration of the cooperation and coordination of the various parts, leading to the study of the systems of organs, viz: the osseous, muscular, circulatory, respiratory, digestive, excretory and nervous systems.

Physiology

Attention is directed to action of enzymes, hormones, secretins and various other cell products and agents. Lectures and recitations are accompanied by laboratory demonstrations and experiments, and while this course is in no wise connected with that given in medicine, the extensive physiology laboratory equipment of the Medical Department is at the disposal of the pharmacy student. Texts, Hough and Sedgwick or Martin's Human Body. Time, five hours per week lectures and recitations and three hours per week laboratory for twelve weeks, or ninety-six hours in all.

Mineralogy

In this course eighty specimens representing the common rocks and minerals are studied. Emphasis is placed upon the occurrence of the common rock-forming minerals, and those which are of considerable economic value. Lectures upon crystallization and thorough quizzes are given. Text, Bennett. Time, thirty hours. In the Ph. C. Course sixty hours laboratory work, consisting mainly of blow-pipe analysis, are added to this course, thus making ninety hours in all.

Commercial Pharmacy I

The first half of the quarter is devoted to book-keeping in which the student is taught to journalize business transactions, to post the same, how to close the ledger, and how to keep a cash book and a set of books especially recommended for a retail drug store. The forms and methods of commercial correspondence are also taught. During the last half of the course the fundamental principles of the law governing business transactions are studied, especial attention being given to the following subjects: sales of personal property, negotiable instruments, partnership, corporations, insurance and real property, banking and bankruptcy. Texts, Benton's Practical Book-keeping, and Spencer's Commercial Law. Time, one hour per day for twelve weeks, or sixty hours.

Latin I

A thorough drill is given in the essentials of Latin grammar. Text, Collar and Daniell. Time, one hour per day for twelve weeks, or sixty hours.

Pharmaceutical Latin

A special drill in medical and pharmaceutical terms, prescription writing, etc. Text, Crothers and Bice. Time, one hour per day for twelve weeks, or sixty hours.

Theoretical Pharmacy I

This course is intended to introduce to the student the subject of Pharmacy. The United States Pharmacopoeia and the National Formulary are thoroughly discussed with regard to history, scope, and purposes. The Dispensatories are also considered. Then are taken up in turn the subjects of metrology, specific gravity, heat and its applications to pharmacy including distillation, methods of comminution, solution, crystallization, percolation, maceration and filtration. A great variety of pharmaceutical apparatus is available for demonstration purposes. The course consists of lectures and recitations. Time, one hour per day for twelve weeks, or sixty hours. Text, Arny's Principles of Pharmacy, or Caspari's Treatise on Pharmacy.

Theoretical Pharmacy II

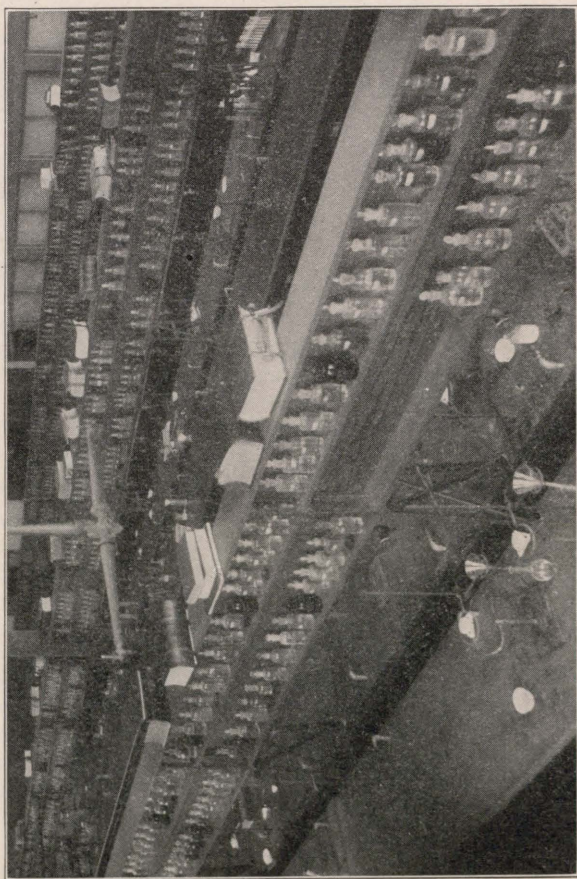
This course covers the subject of galenical pharmacy. Each of the classes of pharmaceutical preparations such as waters, solutions, infusions, decoctions, mucilages, mixtures, emulsions, syrups, wines, elixirs, spirits, tinctures, fluidextracts, extracts, oleoresins, resins, collodions, oleates, liniments, ointments, plasters, suppositories, and others are taken up in turn. All of the Pharmacopoeial and many of the National Formulary preparations belonging to these classes are considered individually. Time, one hour per day for twelve weeks, or sixty hours. Text, Arny, or Caspari.

Theoretical Pharmacy III

This is essentially a review course. A systematic study is made of the Pharmacopoeia and the National Formulary. Coming, as it does, during the last term of the senior year, it serves the purpose of a very thorough review not only of pharmacy proper, but of materia medica and pharmaceutical chemistry. Time, one hour per day for twelve weeks, or sixty hours. Texts, United States Pharmacopoeia and National Formulary.

Arithmetical Pharmacy

This course is intended to provide a thorough training in the



QUALITATIVE LABORATORY

calculations which necessarily accompany many pharmaceutical operations. The student is thoroughly familiarized with all of the systems of weights and measures used in this country. The problems presented also cover the subjects of specific gravity determinations by all of the important methods, conversion of thermometer readings, percentage solutions, alligation, etc. Time, three hours per week for twelve weeks, or thirty-six hours. Text, Stevens' Arithmetic of Pharmacy.

Manufacturing Pharmacy I

The student manufactures a large number of chemicals of pharmaceutical interest. Among these may be mentioned ferrous sulphate, exsiccated ferrous sulphate, washed sulphur, precipitated sulphur, potassium and sodium tartrate, precipitated zinc carbonate, zinc oxide, bismuth citrate, bismuth and ammonium citrate, red mercuric iodide, yellow mercurous iodide, yellow mercuric oxide and others. The manufacturing of galenic preparations is also commenced and representatives of the following classes are made: waters, solutions, infusions, decoctions, syrups, glycerites, spirits, mucilages and liniments. A sample of every preparation made must be submitted to the instructor for inspection and approval. A sufficient number of hours are used each week to provide a class room discussion of the laboratory work. Time, ten hours per week for twelve weeks, or one hundred twenty hours. Text, U. S. Pharmacopoeia with National Standard Dispensatory used as reference.

Manufacturing Pharmacy II

This is a continuation of the preceding course. The more difficult classes of preparations are taken up in turn, and the student manufactures tinctures, fluid extracts, extracts, resins, oleoresins, elixirs, oleates, scale salts and granular effervescent salts. Among the special preparations are the following: ammoniated glycyrrhizin, pyroxylin, collodion, rectified oil of turpentine, terebene, natural salicylic acid, benzoinated lard, acetanilid, recovery of a volatile oil by steam distillation, spirit of nitrous ether, (which is also assayed by the gasometric method), and ointment of mercuric nitrate. Every preparation made must be submitted for inspection. The laboratory work is accompanied by quizzes and discussions in the class room. Time, ten hours per week for twelve weeks, or one hundred twenty hours. Texts as in preceding course.

Dispensing

The first portion of this course is devoted to the manufacture of those classes of preparations generally made extemporaneously, such as ointments, cerates, emulsions, suppositories, troches, compressed tablets, tablet triturates, pills, solution of magnesium citrate, and seidlitz powders. Following this comes actual prescription work. The prescriptions compounded are carefully selected with a view to familiarize the student with all of the dispensing difficulties. The student is given a great deal of practice in dispensing remedies in form of powders, in capsulating both solids and liquids, and in dispensing cachets and wafers. The conditions under which the student works approximate closely those found in the prescription pharmacy. Every prescription dispensed must be labeled and wrapped as in actual practice. The laboratory work is accompanied by lectures and recitations in which dispensing problems are thoroughly discussed. The subject of incompatibilities receives careful attention. Time, two hours per day for twelve weeks, or one hundred twenty hours. Texts, as in preceding courses. Scoville's *Art of Compounding*, and Ruddiman's *Incompatibilities* recommended.

Materia Medica I

This course is devoted to inorganic materia medica, and is concerned principally with the inorganic chemicals of the pharmacopoeia. These are discussed from the standpoint of methods of manufacture, physical and chemical properties, methods of identification, and uses. The student is provided with samples of all of the more important salts, and expected to be able to identify these by means of their physical properties. Time, one hour per day for twelve weeks, or sixty hours. Text, *Army*, or *Caspari*.

Materia Medica II

The student now begins the study of organic drugs. The vegetable drugs are taken up in the order of their botanical classification, commencing with those derived from the lower forms of plant life. Careful attention is given to methods of collection and preparation for market, commercial varieties, means of detecting adulterants, active principles, properties and uses. The Institution is equipped with a very complete collection of vegetable drugs, and the students are provided with samples for examination and study. Time, one hour per day for twelve weeks,

or sixty hours. Text, Culbreth's *Materia Medica and Pharmacology*.

Materia Medica III

This course is a continuation of organic materia medica. The vegetable drugs are completed and the drugs from animal sources are studied. A considerable time is devoted to the study of oils, both fixed and volatile. Time, one hour per day for twelve weeks, or sixty hours. Texts as in Course II.

Alkaloidal Analysis

This is a laboratory course including both qualitative and quantitative work on the chemistry of the alkaloids. The student is taught to make tests for all of the more important alkaloids in galenical preparations, and in stomach contents. Practice is also given in the assay of alkaloidal drugs such as cinchona, nuxvomica and opium. Time, one hour per day for twelve weeks, or sixty hours. No text required, notes given by instructor. References Pictet and Biddle, and Allen, Vols. VI and VII.

Commercial Pharmacy II

This subject is presented by an instructor of wide commercial experience as well as of extensive technical training. It consists of lectures on the subjects of clerks, clerkship and relation to employer; establishing a business; buying, selling and advertising methods; collections; manufacturing; relation to laity and to the physician; business and professional ethics, etc. Time, twenty-five hours, extending throughout the senior year. No text required.

Therapeutics and Toxicology

These subjects given late in the course enable the instructor to apply to advantage the knowledge already gained of chemistry and materia medica. A systematic classification is made of drugs according to their therapeutic properties, and of poisons according to their action, and methods of antidoting. Outlines given by the instructor. Time, two hours per week for twelve weeks, or twenty-four hours.

Bandaging and First Aid

Realizing that the pharmacist is often expected in case of accident to render intelligent aid, either in the absence of or as assistant to the physician, this course is offered. It consists in treat-



MATERIA MEDICA LECTURE ROOM

ment of hemorrhages, collapse, the application of common forms of bandages, aseptic and antiseptic care of wounds, etc. Time, two hours per week for twelve weeks, or twenty-four hours. No text required.

Pharmaceutical Jurisprudence

An elementary and outline discussion of the main divisions of law, with practical application to the practice of pharmacy. The course deals with the meaning and scope of jurisprudence; the general principles of the law of contract, tort, property, agency, partnership, commercial paper, and banking; liability of the pharmacist for his own acts in contract and in tort; liability for the acts of agents and servants; criminal liability; Federal and State regulation by statute of the business and practice of pharmacy. Time, one hour per week for twelve weeks, or twelve hours.

For the **Pharmaceutical Chemist** Course, in addition to the preceding, the following described courses are offered:

German

One year of four terms in German is required in the Pharmaceutical Chemist course. In the first term reading and grammar drill is given, great care being taken that the student acquire a pure pronunciation. This work is continued the second term, the memorizing and singing of German folk songs, and conversation being a feature of the class exercise. In the third term there are taught the principal parts of the strong verbs, folk songs and elementary compositions, and a reading of *Im Vaterland*—a description of Germany and the manners and customs of the Germans. During the fourth term *Immensee* and *Hoeher als die Kirche* are read, with conversation, composition and grammar continued. The aim throughout is to use English less and less in the class room and thus stimulate the art of speaking German. Time, one hour per day for four terms, or two hundred forty hours. Texts, Bacon's Grammar, Roessler's Essentials, and German Classics.

Note.—A four years' course in German is offered, a description of which is to be found in the general catalog. A student may take German throughout his entire pharmacy course without additional expense. If for satisfactory reason the student so elect he may substitute French, Spanish, or Italian for his course in German.



MANUFACTURING LABORATORY

Bacteriology

General bacteriology is first considered. A study of common pathogenic organisms follows. Some consideration is then given to bacteria in the arts and industries; also a study of bacteria of water and of milk and its products. In the laboratory sterilization, preparation of media and staining methods are given. Then is taken up a study of non-pathogenic organisms followed by study of the more common pathogenics. The latter part of the course is given to examination of water, milk, ice cream, etc., qualitatively and quantitatively. Water examination is made with special reference to sewage pollution. Text, Moor and Partridge; reference, Jordan. Time, one hour per day for twelve weeks, or sixty hours lecture and recitation, and sixty hours laboratory, or one hundred twenty hours in all.

Industrial Chemistry

Lectures on fuels, waters, fertilizers, explosives, lime and cements, glass, ceramics, destructive distillation processes and products, petroleum, soaps, carbohydrates, fermentation products, manufacture of heavy chemicals, etc. Lecture course, no text required, but references made to Thorp, Sadtler, Rogers and Wagner. Time, three hours per week for twelve weeks, or thirty-six hours.

Water Analysis

This course is given concurrent with the course in Bacteriology, so that a complete sanitary as well as chemical examination of water may be made. It is essentially, mainly a laboratory course. Text, Leffman, or Mason. Time, one hour per day for twelve weeks, or sixty hours.

Advanced Analysis

There is presented here first, simple analysis of furnace gas, illuminating gas, and sanitary examination of air. Text, Franzen. Notes and directions by the instructor with reference to Sutton, Clowes and Coleman, Newth, and others. Time, two hours per day for three weeks, or thirty hours. Second, a quantitative analysis of cements and common ores of iron, copper, zinc, lead, silver, etc. Application will be made of principles and technique acquired in gravimetric and volumetric analysis. No text required. Notes, directions and references given as in the preceding. Time, two hours per day for four weeks, or forty hours. Third, a short course in the ordinary technical examina-

tion of iron and steel, coke, limestone, and slag. No text required. Notes and directions as above, together with general references to analytic texts and special reference to Blair. Time, two hours per day for five weeks, or fifty hours. One hundred twenty hours in all given in this course.

Pharmaceutical Testing

Many important U. S. P. tests, both qualitative and quantitative, not presented elsewhere in the course, will be taken up here. Practical examination of various pharmaceuticals will be made to determine if they come within the "purity rubric" demand. Text, United States Pharmacopoeia, together with various references. Time, one hour per day for one term, or sixty hours.

Synthetic Chemistry

A laboratory course in which a selected list of substances is made illustrative of typical classes of compounds, and of type reactions. Both the aliphatic and the cyclic series are dealt with. Text, Cohen, with Gattermann, and Lassar-Cohn as references. Time, two hours per day for one term, or one hundred twenty hours.

Foods and Food Analysis

A laboratory course accompanied by lectures. The lectures embrace a consideration of the different classes of food principles, the amount of each necessary, and the purpose served by each. Different varieties of foods are considered in some detail, together with a discussion of their adulteration. The national and state food and drug laws are discussed.

The laboratory work includes examination of many classes of food materials, such as milk, spices, flavoring extracts, baking powders, edible fats and oils, sugar and saccharine products, and alcoholic beverages. The student is familiarized with a great variety of chemical apparatus and processes not met with in his ordinary pharmaceutical work. Time, four hours per day for twelve weeks, or two hundred forty hours. Text, Leffmann and Beam, with Leach as reference.

Microscopy

A laboratory course devoted to the microscopical examination of powdered foods and drugs. Most of the crude organic drugs purchased by the pharmacists are in a comminuted condition,

and in this state adulterations are difficult to detect by ordinary or macroscopical examination. Hence, it becomes necessary that the pharmacist who would be assured of the quality of the vegetable drugs used in the manufacture of his preparations, be prepared to use the microscope intelligently. It is understood that the forthcoming or ninth revision of the Pharmacopoeia will devote considerable space to the description of the appearance of powdered drugs as viewed under the microscope. Time, one hour per day for twelve weeks, or sixty hours. Reference, Greenish and Winton.

Fees and Expenses

No matriculation fee is charged. The general tuition of \$20 per term not only admits the student to all courses offered in the Department of Pharmacy but to those in other departments as well, with certain exceptions such as music, law or dentistry. The tuition, if paid in advance for the six terms necessary to complete the Graduate in Pharmacy Course, is fixed at \$100.00. This makes a reduction of one term's tuition, or \$20.00. If paid for one year of three terms \$55.00, making a reduction of \$5.00. If paid for eight terms in advance, the tuition is \$125.00, making a saving of \$35.00 for those taking the Pharmaceutical Chemist Course. There is also a further provision that in case of withdrawal, regular term rates are charged for the time in attendance, including that term during which the student leaves, and all money paid in excess of this charge is refunded. Thus no one is obliged to continue work in this Institution if dissatisfied. The laboratory fees are as follows:

Experimental Chemical Laboratory fee, one term	\$2.50
Analytical Chemical Laboratory fee, two terms, each	4.00
Physical Laboratory fee, one term	2.50
Pharmaceutical Laboratory fee, two terms, each	6.00
Dispensing Laboratory fee, one term	7.00
Physiological Laboratory fee, one term	1.00
Botanical Laboratory fee, two terms, each	1.50
Physiological Chemical Laboratory fee, one term	2.50
Volumetric Chemical Laboratory fee, one term	3.50
Mineralogy fee, one term	1.00
Alkaloidal Chemical Laboratory fee, one term	3.50
Histological Laboratory fee, one term	1.00
And in addition for the Pharmaceutical Chemist Course:	
Bacteriological Laboratory fee, one term	\$2.50

Water Analysis fee, one term	2.50
Advanced Analysis (Gas, Ore and Iron) fee, one term ..	4.00
Synthetic Organics fee, one term	7.50
Food Analysis fee, one term	12.00
Pharmacopoeial Assaying fee, one term	3.50
Microscopy fee, one term	2.00
Blow-pipe Analysis fee, one term	2.00

These charges pay for all gas, water, chemicals, and use of apparatus. A charge is made for any breakage, and also for filters, towels, vials, etc., which become the property of the student. There are no other special charges, such as examination fees and quiz class fees. The diploma fee is \$5.00 for the degree of Graduate in Pharmacy, and \$10.00 for the degree of Pharmaceutical Chemist.

A summary of expenses may be made as follows:

Tuition \$20.00 per quarter, or if paid in advance, \$100.00 for the six terms of the Graduate in Pharmacy Course; or \$125.00 for the eight terms of the Pharmaceutical Chemist Course. The laboratory fees are as low as the equipment and material furnished will permit them to be. There is no reduction for their payment in advance.

Board may be had at from \$18.00 to \$24.00 per term of twelve weeks, being at the rate of \$1.50 to \$2.00 per week.

Furnished rooms for rent are arranged in suites, each suite to be occupied by two students. The charges are from 50 cents to \$1.00 per week for each student. There is no additional expense except for heat and light. The cost of heat does not exceed \$5.00 per term of three months even in the most severe weather, while the cost of light depends entirely upon the individual student. Private families will duplicate these rates, so that the student may exercise his pleasure in taking accommodation with the University or elsewhere.

Board, tuition, and furnished rooms for each Pharmaceutical Chemist year of forty-eight weeks, if paid in advance, \$161.00; or for each Graduate in Pharmacy year of thirty-six weeks, \$127.00.

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