UNIVERSITY OF ILLINOIS

Report of the

DEPARTMENT OF PHYSICS

to the Dean of the

COLLEGE OF ENGINEERING

May, 1918
This report of the Physics Department discusses questions in Courses and Registration
Summer Session
Departmental Staff
War Conditions and Physics

The Appendix Contains
Tables of Courses in Physics given in 1917-1918
Registrations in Physics Courses in 1917-1918
Addresses and Speakers for the Physics Colloquium 1917-1918
List of Publications and Addresses by Members of Physics Department, 1916-1917
Report of Dr. Watson on Summer Session 1917
Copies of Reports to Head of Department by Men in Charge of Courses in Physics
May 1, 1918

Dean C. R. Richards
College of Engineering

Dear Sir:

I am hereby submitting a report of the work of the physics department for the academic year 1917-1918. It includes as part of the same, the reports from members of the department who have charge of courses.

Courses and Registrations.— The table at the end of this report gives the number of students registered in each course offered by the department, indicates the character of the course, the number of hours, and the instructors. When compared with the corresponding table of the last annual report it will be noted that there has been a decrease in the numbers registered in most of the courses. The registrations in the physics department from the College of Liberal Arts and Sciences are in general larger than in 1916-1917, but the registrations from the College of Engineering have fallen off about one-third in the sophomore courses, and a considerable more in the upper class courses. As a result, we have for the general courses in sophomore physics from 75% to 80% of the registration in the previous year. In the course in electrical measurements which is taken by the junior electrical engineering students, the registration is only about two-thirds of that of a year ago. In the other courses taken by juniors and seniors we have approximately 80% of the registrations of a year ago. In the graduate courses the registration is about 30% of that of a year ago.

It seems likely that even if the war continues for two years or more, the above figures are likely to be nearly the minimum figures, unless the draft age should be lowered to nineteen years. In another year we are likely to have returning to us some students who have been in some way incapacitated for further service, so that we may expect some increase in succeeding years, particularly in the upper classes. When such students return the state university certainly should have the doors open so that these men may continue their university training.

We find that there is an increasing demand for women, not only for the assistantships in the colleges and for instructorships in high schools, but also as assistants in the research laboratories. After these fields are once really opened to the women there is likely to be an increased number of them wanting courses in our university laboratories. And further, if the war should last until it begins to make
inroads on the man supply for the industries, (an actuality in Europe), the continuance of the industries will depend upon women trained in the physical sciences.

The Senate approved last June the offering of a curriculum in "General Engineering Physics", and this was announced in the bulletin of "Announcement of Courses" for September, 1917. We have, however, not had any registrations in this course during the present year. With the decided shrinkage in the number of men students and the general uncertainty in the plans of many, a new course of this kind has not received the attention which it would have received at other times. We believe, however, it is a move in the right direction, and that the war experience is emphasizing the need of men who are trained in the sciences fundamental to engineers and to the technical fields.

Summer Session.—I am including in this report the report made by Dr. F. R. Watson of the work in physics during the summer of 1917. The work was successful in spite of the war conditions which decreased the number of registrations of men. One course that was given, namely Physics 221, consisted of more or less popular lectures on recent advances in physics by different members of our staff. This course attracted a good deal of attention and is one that we might well think of introducing during one of our regular semesters when conditions make it possible.

The students in the Summer Session are largely teachers in the public schools of Illinois, and indeed are the teachers of our future university students, so that the work has a wider value than the immediate courses that are given during any session.

Departmental Staff.—All of our men of rank above instructor who were with us the year previous have been with us during this last year. We have, however, lost a considerable number of instructors, assistants and fellows, in the department within the year. The following men who have been with us within a year are now in some form of war service, either directly or in some war industry.

Bayley, P. L. — Instructor in U.S. School of Military Aeronautics
Booth, H. T. — Curtiss Engineering Corporation, Long Island, N.Y.
Fazel, C. S. — Instructor in U.S. School of Military Aeronautics
Hyslop, W. H. — In charge of Wireless Telegraphy, U.S. S. M. A.
Lapp, C. J. — Enlisted in Signal Corps, U.S. A., assigned to Bureau of Standards
Lucas, P. H. — Searchlight Division, U.S.A., France
Nelson, R. A. — Enlisted in U.S.A., Ft. Wright, N.Y.
We have not been able to fill all the vacancies and in this respect we are in the same conditions as nearly every department of physics in the country. The present call for assistants and instructors in physics from the colleges is very great. The Government is also asking for men of training and skill in physics for its war service. By rearranging our courses, changing our methods somewhat, we have been able and expect to be able to carry the instruction with substantial efficiency.

Drs. Kunz and Knipp of this department have, in addition to their regular work, been helping during this second semester in the instruction for the special course in radio telegraphy which has been outlined by the United States Signal Corps, and which is being given here under the direction of the electrical engineering department. The students in this course are preparing to become radio experts for the United States Army, and Drs. Kunz and Knipp have been glad to help this work in their special fields.

War Conditions and Physics. — The attention of a number of our staff has been taken up with problems connected with the war. These have been in general suggested by the National Council of Research, a branch of the National Council of Defense. Some of our staff have been called into consultation during the year, but the nature of this is, of course, confidential.

The war conditions have broken up our regular lines of development so that sometimes it seems as if we were going backward in our physics work. Yet, I can not but believe that there will come out of it something good and stimulating for the physics work at this university. The demand for men trained in physics, and the dependence of the world for more knowledge of physics, was never more apparent than it is today. The fact that we have been obliged to break our routine and revise our courses to meet the extraordinary conditions will be a good thing for our physics work, although at present it is apparently disorganizing.

In conclusion I wish to testify to the hearty cooperation with which all the men in the department have been working, and particularly to the men who have had independent charge of work, namely, Drs. Knipp, Watson, Kunz, Schulz and Williams. Our shop mechanic, Mr. J.B. Hays, also deserves mention for his active interest and efficient service in the cause of the departmental work.

Yours truly,  

[Signature]

Copy:
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<thead>
<tr>
<th>No. and Character of course</th>
<th>No. Students in Course</th>
<th>Work each week</th>
<th>Instructors</th>
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<td>Physics 2. Laboratory course for</td>
<td>I 258</td>
<td>2 two-hour laboratory sections a week in 13 sections first semester and 10 second semester</td>
<td>W. F. Schulz E. H. Warner C. F. Pike E. R. Stephenson R. A. Nelson</td>
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<td>Physics 4. Electrical measurements for Jun. students in E. E.</td>
<td>II 43</td>
<td>3 sections of 2 3-hr. laboratory periods</td>
<td>C. T. Knipp-Head S. Karrer</td>
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<td>Physics 7, 8. Lectures and lab. in general physics for non-engineering students</td>
<td>I 90, 89</td>
<td>2 lectures weekly and 1 quiz in 4 sections. 3 2-hr. lab. periods weekly in 2 sections</td>
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<td>Physics 9, 10. Lectures and lab. in general physics for Architecture students</td>
<td>II 62, 61</td>
<td>2 lectures weekly and 1 quiz in 2 sections. 2 2-hr. lab. periods in 1 section</td>
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<tr>
<td>Physics 14a. Introduction to Theoretical Physics</td>
<td>I 6</td>
<td>Recitations, problems and lectures. 3 hrs. per week</td>
<td>A. P. Carman</td>
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<td>Physics 15. Electricity and Magnetism</td>
<td>I 3</td>
<td>3 3-hr. lab. and recitation periods weekly</td>
<td>C. T. Knipp</td>
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<td>Physics 16. Heat</td>
<td>I 11</td>
<td>2 lectures or 3 2-hr. recitation periods weekly</td>
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<td>Physics 17. Lectures &amp; recitations on Light</td>
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<td>1 lecture, 1 3-hr. lab. period weekly</td>
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<td>2 lecture hours per week</td>
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<td>Physics 22. Light Photometry</td>
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<td>Physics 23. Sound</td>
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<td>2 1-hr. lec. &amp; recitation periods. 1 3-hr. lab. period</td>
<td>W. F. Schulz</td>
</tr>
<tr>
<td>No. and Character of Course</td>
<td>No. Students in Course</td>
<td>Work each week</td>
<td>Instructors</td>
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<td>Physics 24. Properties of Matter</td>
<td>II 3</td>
<td>3 l-hr. lec. &amp; recitation periods, 1 3-hr. lab. period</td>
<td>E.H. Williams</td>
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<td>Physics 27. Fundamental Physical Measurements</td>
<td>II 2</td>
<td>1 3-hr. laboratory period per week</td>
<td>E.H. Williams</td>
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<td>Physics 20. Introduction to Theoretical Electricity</td>
<td></td>
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<td>Physics 31. Special Prob. in adv. physical measurements</td>
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<td>1 lec. hour per week</td>
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<td>Physics 104 Selected Problems in Elec. Measurements</td>
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<td>3 3-hr. lab. periods per week</td>
<td>C.T. Knipp</td>
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<td>Physics 121. Recent Adv. in Physics &amp; Electron Theory</td>
<td>II 2</td>
<td>1 2-hr. demonstration lecture per week</td>
<td>C.T. Knipp</td>
</tr>
<tr>
<td>Physics 124. Conduction of Electricity Through Gases</td>
<td>I 3</td>
<td>Three times per week</td>
<td>C.T. Knipp</td>
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<td>Physics 127a,b. Electron Theory</td>
<td>II 1</td>
<td>Two lecture hours per week</td>
<td>J. Kunz</td>
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<td>Physics 131. Individual lab. problems</td>
<td>I 6</td>
<td>2-4 times per week</td>
<td>A.P. Carman, C.T. Knipp, F.R. Watson, J. Kunz, W.F. Schulz</td>
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<tr>
<td>II 4</td>
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<td>Physics 132a. Elasticity &amp; Hydrodynamics</td>
<td>I 4</td>
<td>3 lecture hours per week</td>
<td>J. Kunz</td>
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<td>Physics 132e. Theory of Elasticity</td>
<td>II 3</td>
<td>Four 1-hr. lectures per week</td>
<td>J. Kunz</td>
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652
Addresses and Speakers for the Physics Colloquium 1917-1918

Sept. 27:
Talks by Professor Carman and Dr. Williams
Organization meeting

Oct. 4:
Dr. C.T. Knipp: "The Production of High Vacua"

Oct. 11
Mr. C.S. Fazel: "The Nucleus of the Atom"

Oct. 18
Dr. E. Berson: "Reflection of X-Rays"

Oct. 25
Mr. R.A. Nelson: "The Amplification of the Photoelectric Current
By Means of the Audion"

Nov. 1
Mr. E.H. Warner: "The Increase of Pressure in the Corona"

Nov. 15
Dr. Jakob Kunz: "Report on the Rochester Meeting of the
American Physical Society"

Nov. 22
Dr. F.R. Watson: "Perception of the Direction of Sound"

Dec. 6
Professor A.P. Carman, Dr. J. Kunz: "Report of Chicago
Meeting of the American Physical Society"

Dec. 13
Dr. Jakob Kunz: "Range Finders and Periscopes"

Jan. 10
Dr. C.T. Knipp: "Report of Pittsburgh Meeting of American
Physical Society"

Feb. 21
Dr. Jakob Kunz: "The Audion and Its Application"
Addresses andSpeakers for the Physics Colloquium 1917–1918

Feb. 28

Dr. E.H. Williams: "Variation of the Magnetic Properties of Some Rare Earths with Temperature"

Mar. 5

Dr. Jakob Kunz and Dr. C.T. Knipp: "The Aurora Borealis"

Mar. 14

Dr. Jakob Kunz: "Some Electrical Discharge Phenomena"

Mar. 21

Dr. Jakob Kunz: "Images and Elliptic Functions"

Mar. 28

Easter Vacation

April 11:

Dr. F.R. Watson: Report on Visit to Bureau of Standards and Western Electric Company

April 18

Dr. C.T. Knipp: "Report on Visit to University of Texas"

April 25

Mr. E.H. Warner: "The Pressure Increase in the Corona"

May 2

Dr. Jakob Kunz: "Electric Solution of the Biquadratic Equation of Coupled Circuits"

May 9

Mr. W.H. Hyslop: "Apparatus and Methods for Producing Undamped Electric Waves"

May 16

Mr. C.E. Pike: "The Amplification of the Photoelectric Current"
PUBLICATIONS and ADDRESSES

1917-1918

Anderegg, C.C.

Publications:


Booth, H.T.

Publications:


Carmen, A.P.

Publications:

"The Collapse of Short Thin Tubes" Bulletin No. 99 of the Engineering Experiment Station, University of Illinois.

Crotzer, E.J.

Publications:


Knipp, C.T.

Addresses and Papers:

"The Conduction of Electricity Through Gases - the Electron" Joint meeting of Indiana Academy of Science and Sigma Xi, Indiana University, Bloomington, Ind., Dec. 7, 1917.

"Electric Discharge Through Vacuum Tubes - the Electron" Sigma Xi at Purdue University, Lafayette, Ind., Mar. 8, '18.

"Electric Discharge in Vacuum Tubes - The Electron" University lecture, University of Texas, Austin, Texas, April 10, 1918.

"The Production of High Vacua and a Possible Standard of Sound" Sigma Xi at University of Texas, Austin, Texas, April 11, 1918.
PUBLICATIONS and ADDRESSES

C.T. Knipp


J. Kunz

Publications:


E.H. Warner

Publications:


F.R. Watson

Publications:


Addresses and Papers:


"Recent Developments in Acoustics of Buildings" 29th Educational Conference of Academies and High Schools, in Relation with the University of Chicago, April 13, 1917.

August 6, 1917

Professor A. P. Carman
Department of Physics

Dear Sir:

I report herewith on the work in Physics in the 1917 Summer Session. The courses planned for the Session were much the same as usual but changes were made necessary because of the withdrawals of Mr. Hyslop and Mr. Booth. Mr. Hyslop was called as instructor in the Aviation School and Mr. Booth left to take up employment with a commercial firm. Mr. S. Karrer was employed to take Mr. Hyslop's place, while Mr. Booth's work was cared for by giving extra work and compensation to Mr. Nelson.

The courses given after the rearrangement are as follows:

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<th>Course</th>
<th>Enrollment</th>
<th>Visitors</th>
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Additional reports on these courses are given in attached reports from the various instructors. I append also two copies of the Program and Announcement of Courses.

The popular lectures in Recent Advances in Physics (Physics 21) proved satisfactory. Eighteen students registered for credit. Visitors swelled the number in attendance from 35 to 60, depending on the weather and the subject of the particular lecture. This course might profitably be repeated during the Fall or Spring Semester.

The attendance was decreased about 15% because of war conditions. The larger part of the students were teachers.
Those of the Physics Department present did excellent work and the usual harmony prevailed.

Respectfully submitted,

(Signed) F.R. Watson

In Charge of Summer Session Physics, 1917

DMR
April 29, 1918

Professor A. F. Carman
Department of Physics

Dear Sir:

The following is a report of the work that I have had in charge during the present academic year.

Physics 4. — This course, by reason of the decreased enrollment, was scheduled last fall for three sections instead of four as obtained since the fall of 1915. Even with the decrease in attendance the sections were not crowded. The instructional work was as a result carried by two instructors instead of two instructors and an assistant as heretofore. The department was particularly fortunate this year in having Mr. S. Karrer available for this work. His teaching has been most satisfactory. He has combined scholarship and general utility about the laboratory in a way that relieved me of much routine work. He is popular among the students, accommodating, yet he holds them to strict account. I should be very much pleased if he could be continued in this capacity through next year.

Enrollments in Physics 4

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<th>Non-Eng.</th>
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<td>11</td>
<td>0</td>
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<tr>
<td>N</td>
<td>W F</td>
<td>11</td>
<td>12</td>
<td>0</td>
</tr>
</tbody>
</table>

There was only one applicant for work in the special section, for graduate students in Chemistry, and he enrolled in one of the regular sections and took the work with the engineers.

Physics 15. — I Semester, Elementary Electricity and Magnetism. A three-hour course in text and laboratory. Attended wholly by non-engineering students. One graduate, three undergraduates. Total enrollment, 4.

Physics 31b. — I Semester, Enrollment 1.

Physics 134. — I Semester. Graduate students only. Enrollment 3.

Physics 30. — II Semester. Elementary Mathematical Electricity and Magnetism. Enrollment 4 (All foreigners, 1 graduate, 3 seniors in E.E.).
Physics 31. - II Semester, Enrollment 1.

Physics 121. - II Semester, Enrollment 2 (1 senior, 1 graduate).

Physics 131. - II Semester Enrollment 1 (graduate).

The attendance in Physics 4a and 4b (noted above) was very much reduced over what it was in the fall of 1916-17, though considerably in excess of what was anticipated based upon the attendance of last spring. Comparatively few have withdrawn for military purposes this semester. The E.E. department intimated recently that the probable enrollment of juniors next fall would be between 30 and 35.

Advanced Degrees. - There are no candidates with me this year for the Doctor's degree. Mr. P.L. Sayler, who normally would have come up for his doctorate in June, entered the ground school of Military Aeronautics as an instructor. His work on his thesis thus terminated (for the present) last November.

There is one candidate for the Master's degree, Mr. C.L. Hoon, who will finish his thesis by the prescribed time.

Research. - My own research work has been only fairly successful. A number of distractions have come up during the course of the year that made consecutive research work nigh impossible. I have published no articles since May 1, 1917. Two problems at the present time are the subject of investigation. - a) Continued work on "An Improved High Vacuum Mercury Vapor Pump", and b) "On a Possible Standard of Sound."

The phenomenon indicated in the last subject is one that I chanced upon while constructing the mercury vapor pump. It is an instance of how new phenomena come to one's attention when he least expects them as the direct result of keeping experimentally busy. Though first observed in December, I have found but little time to investigate it systematically. From present indications it may have a practical bearing.

Addresses. - The following addresses were made and papers read for the year May 1, 1917 - May 1, 1917.

"The Conduction of Electricity Through Gases - the Electron" Joint meeting of Indiana Academy of Science and Sigma Xi, Indiana University, Bloomington, Indiana, Dec. 7, 1917.

"Electric Discharge through Vacuum Tubes - The Electron" Sigma Xi at Purdue University, Lafayette, Indiana, Mar. 9, 1918.

"Electric Discharge in Vacuum Tubes - the Electron" University lecture, University of Texas, Austin, Texas, April 10, 1918.

"The Production of High Vacuum and a Possible Standard of Sound" Sigma Xi at University of Texas, Austin, Texas, April 11, 1918.
Papers Read at Scientific Meetings.

"A Possible Standard of Sound" (Demonstration, 10 min.) Pittsburgh meeting of the Am. Phys. Society, Dec. 27-29, 1917.
(Abtract of the above papers are to appear in the Proceedings of the meeting - The Physical Review)

Following up your suggestion, I have been thinking seriously of making several rather radical changes in the experiments given in Electrical Measurements - Physics 4, especially during the second semester. There is no doubt in my mind that several of the more or less classical experiments in the measurement of self-inductance should be replaced in part at least by some of the newer methods which are the result of research in high frequency oscillation currents and radio-communication. One need only note that the nickel-iron filing coherer has been wholly replaced by the audion (the kathtron, the pliotron), and by the aid of the electron tube the whole range of measurements relative to alternating currents is being revolutionized. It seems to me opportune to enter actively into this newer field, adding such of the experiments to Physics 4 the second semester for which we may be able to procure and construct the apparatus. The importance of the above has impressed me the more as I have visited the ground school here and the one at Austin, Texas; and also from my experience in assisting in the presentation of that new course on Radio-Communication (E.E. 94) this semester.

The new course on Radio-Communication that is being offered by the E.E. department has drawn upon the physics department for part of its instruction. Dr. Kunz has just completed giving considerable of the theory for this course, and I am giving the lectures on vacuum tubes. By May 1, when my part of the instruction ends, I will have given a total of 14 lectures. About half of the number were experimental.

During the year I have had the honor of addressing Sigma Xi open meetings at Indiana University, Purdue University, and the University of Texas. Visiting these institutions is of the greatest value to me in furnishing suggestions for the improvement of the work that I am doing here at home. I was especially impressed with the equipment in Electrical Measurements at the University of Texas.

Respectfully submitted,

Professor of Exp. Electricity

DWR
April 30, 1918

Professor A. P. Carman
Department of Physics

Dear Sir:

As requested in your letter of April 18, I am reporting on the work in the Physics Department under my charge.

The number of students has decreased because of war conditions, the attendance being shown in the following table for the present year and the preceding year.

<table>
<thead>
<tr>
<th>Course No.</th>
<th>1917 I</th>
<th>1917 II</th>
<th>1918 I</th>
<th>1918 II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phys. 7, 9 (General Physics)</td>
<td>136</td>
<td>90</td>
<td>114</td>
<td>74</td>
</tr>
<tr>
<td>Phys. 16 (Heat)</td>
<td>12</td>
<td></td>
<td>11</td>
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</table>

It is noticeable that the proportion of girl students is greater than before.

Mr. Fritts, who was assigned to help me in Physics 16 and 23 and in investigational work, went into the Signal Corps in connection with war work. His absence left considerable work which was partially taken by a student assistant. I had some question of omitting the laboratory work in Physics 23 because of lack of help, but finally continued it.

The question has arisen concerning the advisability of making the laboratory work an optional part of the intermediate courses Physics 16 and 23. This action would be quite acceptable to mathematics students and to other students for various reasons. I am therefore suggesting that we try the plan of giving a three hour theoretical course in Physics 16 and in Physics 23, with an optional 1 hour laboratory period.

Research work for myself has been confined largely to war problems. This work has proved very interesting and I hope will be of practical use. The investigations have suggested a number of additional problems which can be looked forward to in the future when the war is over and the desire for practical results along certain lines is not so pressing.

The departure of many of our graduate students for war work has decreased our research work and has also affected our Colloquium where such work has been discussed. It seems likely that we shall modify our program plan to discuss published articles at some of the meetings. A list of Colloquium speakers and topics is appended.
Aside from the items mentioned, I have nothing particular to report. The Department enjoys the usual harmony of its staff in its various activities.

Respectfully submitted,

F. R. Watson

Professor of Experimental Physics
Urbana, Illinois, April 29, 1918

Professor A. P. Carman  
Head of the Department of Physics  
University of Illinois

Dear Sir:

I beg leave to submit to you the following report of my work during the school year 1917–1918.

In the first semester I had three lecture courses:
1. Theory of electric oscillations
2. Theory of elasticity
3. Theory of radiation (seminar course)

and the direction of research carried out by E.H. Warner and S. Karrer for a doctor's thesis.

The number of students became smaller and smaller and in the second semester only one regular course was given, namely, theory of elasticity. In addition I was asked by the Department of Electrical Engineering to give a series of lectures on electrical oscillations for the special class in wireless telegraphy as requested by the Government.

In the second semester Mr. Karrer has brought his investigation for a doctor's degree to a satisfactory conclusion. Mr. Pike has carried out some interesting measurements on the amplification of photoelectric currents, and Mr. Shinomiya on photoelectric problems.

Yours very respectfully,

(Signed) Jakob Kunz
Urbana, Illinois, April 30, 1918

Professor A. P. Carman
Physics Laboratory

Dear Sir:

I beg to make the following report of the courses conducted by me during the year 1917-1918.

First Semester

Physics 1- Two quiz classes of 27 and 30 students respectively.
Physics 3- Conducted with the assistance of Messrs. Warner, Nelson, Pike and Stephenson. Total 273 students.
Physics 20- Advanced Optics. 2 students enrolled.
Physics 22- Advanced Light Measurements. 4 students enrolled.

Second Semester

Physics 1- Two quiz classes of 27 and 20 students respectively.
Physics 3- Conducted with the assistance of Messrs. Warner, Pike and Stephenson. Total 210 students.
Physics 17- Intermediate Optics. 1 student enrolled.

Nothing of special importance has developed in the conduct of these courses, and I have no suggestions to make with regard to changes. The work has proceeded quite smoothly, and with very few interruptions. The number of students withdrawing during the last semester being quite small to days (7 in all).

Respectfully submitted,

W. F. Schulz

Assistant Professor of Physics
April 20, 1918

Professor A. P. CARMAN
Department of Physics

Dear Sir:

In answer to your request of April 16, I wish to submit the following report concerning the work with which I am most closely connected.

The elementary course for Arts and Science students had a very large falling off in enrollment during the year as is shown by the following table:

<table>
<thead>
<tr>
<th>Course</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 8a &amp; 8b</td>
<td>I Sem. 97 II Sem. 87</td>
</tr>
<tr>
<td>Physics 10a &amp; 10b</td>
<td>I Sem. 27 II Sem. 16</td>
</tr>
</tbody>
</table>

Of the 97 enrolled at the beginning of the first semester, 8 withdrew during the semester for war work and other reasons. It is interesting to note that out of 33 girls enrolled the first semester only 10 enrolled the second semester. The reasons given in most cases was that the work is too difficult.

Notwithstanding the large decrease in enrollment we have had to keep the same number of sections. However, the smaller sections allow us to give more individual attention to the students.

The equipment for the above courses has been improved during the past year, especially by the addition of new D'Arsonval galvanometers and improved tangent galvanometers. The new equipment planned will still further improve facilities.

The breaking up of Physics 24, Properties of Matter, into Physics 24, a text-book course, and Physics 27, a laboratory course, has worked out very satisfactorily. The enrollment in Physics 24 is light. Only two are enrolled in Physics 27. There probably would have been only two or possibly three if the courses had been combined.

Concerning my personal work, I have been able to finish the work that I started last year on "The Magnetic Properties of Some Rare Earths as a Function of the Temperature," and I hope to have it in print in the near future.

While the results this year, especially the falling off in attendance, have been most discouraging from the standpoint of the school work, yet on the whole one cannot feel
discouraged for I am sure that one would not feel proud of a report that showed conditions otherwise under the present circumstances.

Very truly yours,

E. H. Williams

Associate in Physics