The Department of Physics
Kansas State College
1885-1934
By J. T. Willard

During the early history of the College, physics and chemistry were handled in the same department. This has been treated in the history of the department of chemistry. September 1, 1885, a newly created department of mechanics, physics and engineering was placed in charge of Mr. E.B. Cowgill, who came from newspaper work on the Sterling Gazette. He was a graduate of the University of Iowa, and had had teaching experience also in that institution. He came to the faculty with the rank of instructor but was advanced to a professorship the next year. He resigned after two years of capable service.

Professor Cowgill's department was housed in the southwest corner of the second floor of Anderson Hall. There was an office and private laboratory adjacent to the classroom and cases for storage of apparatus were placed in the then undivided corridor.

No general laboratory work was provided for students, but special and graduate students were accommodated in the professor's quarters. Regular laboratory work in physics was not given until the department was housed in Denison Hall in 1902.

No change was made in the curriculum during Professor Cowgill's administration, but the character of the instruction in the course in physics was changes, and Miller's Chemical Physics as the test-book, was replaced by Atkinson's translation of Ganot's Physics. Ganot was retained as the textbook until 1893, when it was displaced by Barker's Physics.

With the resignation of Professor Cowgill in 1887, the department created for him was dismembered. The work in mechanics and engineering was given to O.P. Hood,

superintendent of the mechanical department. Mr. Hood was graduated in 1885 from Rose Polytechnic Institute, and had been superintendent of the mechanical department here the proceeding year, 1886-1887. He was a young man of excellent personality and ability, and a successful teacher. In 1897 he influenced the administration in the inauguration of the curriculum in mechanical engineering January 4, 1898.

Instruction in physics entered a period of instability due to changes of personnel at short intervals. During the two years 1887 to 1889 the classes were taught by Instructor Frederick J. Rogers, a member of the class of 1885, who received his master's degree in June 1887. His high promise of success was fulfilled by his work during this period, and later by study and service in Cornell University, and as professor of physics in Stanford University. In addition to physics and meteorology, Mr. Rogers taught English and arithmetic in the preparatory department.

In 1889-90 physics was taught by Lieutenant J.F. Morrison, professor of military science and tactics. The metereological observations were made by Mr. C.M. Breese of the department of chemistry. Mr. Breese also made these observations the next year, and from July 1894 to June 1897. From 1890 to 1894 the records were kept by Professor Nichols, and he resumed this duty in 1897. Since then they have been continuously in charge of some member of the physics staff. When Mr. Breese first took charge of this work he found that the averages were erroneous in many cases in preceding records, and considerable labor was employed in checking them, and in copying some of the older records into suitable books. He introduced the use of a simple instrument for adding.

In 1890 Earnest R. Nichols was elected instructor in physics, and superintendency of the instruction in telegraphy was made one of his duties. Eh also taught some of the

classes in Mathematics, and made the meteorological observations. He was a graduate of the Iowa State Normal School and the State University of Iowa. He had had several years of experience as a teacher in country and city schools and from 1887 to 1890 was assistant professor of mathematics in the State University of Iowa, and received the degree Master of Arts from that institution in 1890. At that time no one could have anticipated his future career at the Kansas College. He was advanced to the rank of professor in 1891, and the department of telegraphy was abolished at the end of the year 1890-91.

Expecting for the lack of laboratory facilities for students, instruction in physics during the years 1890 to 1894 was on standard lines, and significant additions to the equipment were made.

June 14, 1894, Professor Nichols was given leave of absence without pay for the year beginning September 1, 1894, for the purpose of advanced study of physics and mathematics at the University of Chicago. He also was permitted to spend the vacation months of July and August 1894, in the same way. By that arrangement he was able to get four and one-half consecutive quarters for study.

In a revision of the course of study in 1894 a term of elementary physics was provided in the first year. This provision went into effect for the college year 1894-95, during the absence of Professor Nichols.

The board of regents did not employ anyone to serve as acting professor of physics during the absence of Professor Nichols, but established a professorship in political economy, and distributed the work that Professor Nichols had been doing, and the additional teaching of elementary physics among several teachers. Thomas E. Will,

who was elected professor of political economy, taught the classes in elementary physics, and Professor Failyer, head of the department of chemistry, taught the advanced classes in physics.

In the Tenth Biennial Report, 1894-1896, Professor Nichols commented favorable upon the effect of the course in elementary physics for first-year students because of the useful, practical character of the knowledge, which it gave. He also emphasized again the need of facilities for laboratory work by students of physics. A building for physical science was requested to provide for physics and chemistry.

In the Eleventh Biennial Report Professor Nichols again referred to the need of a building for the department and gave a list of rooms needed, as follows: "A lecture-room, laboratory for advanced work, laboratory for elementary work, apparatus room, private laboratory, office, photometer room, battery room, meteorological room, preparation room and repair room."

July 13, 1899, on motion of Regent Hunter, the board of regents established the curriculum in electrical engineering by the following resolution: "Resolved that we establish a course of electrical engineering, and that the same be under the charge of the physics department." The curriculum was included in the catalogue for 1899-1900. It differed from the curriculum in mechanical engineering in only a few courses in the senior year.

The Twelfth Biennial Report, 1898-1900, is signed by Professor Nichols as professor of physics and electrical engineering. The name of Theodore Lindquist is also signed as assistant in physics, 1899-1900. During the second year of the biennium Professor Nichols was acting president of the college and as this office took most of his

time Mr. Lindquist did nearly all of the teaching of physics. In 1899-99 Mr. Roy S. Kellogg assisted by teaching two classes in elementary physics.

May 31, 1900, the chemistry building was destroyed by fire. This accident created a special opportunity to obtain provision for laboratory instruction in physics in the erection of a building for housing chemistry and physics. Acting President Nichols estimated the cost at not less than $80,000.

With the beginning of the college year 1900-01, Benjamin F. Eyer began service as professor of physics and electrical engineering. A sketch of his previous teaching experience was given in the Industrialist for October 23, 1900, page 48. His latest connection before coming to this college was as vice-principal and professor of physics and biology in the Topeka High School. The high reputation as a teacher, which he had built up there, was amply sustained in his work here. Mr. Lindquist continued as assistant in physics.

In his report for 1900-01 Professor Eyer outlines his ideas in respect to the development of the department that was necessary to enable it to perform its function in the collect.

April 5, 1901, Professor Eyer was granted leave of absence for one year from July 1, 1901, for the purpose of study at the Armour Institute of Technology, Chicago. July 8, 1901, L.W. Hartman was elected professor of physics and John O. Hamilton assistant in physics.

For the second year of the biennium Professor Hartman made the report, and notes that “This year for the first time students have been graduated form the course in electrical engineering. Throughout the whole year the lack of suitable electrical

apparatus for this class of students has been painfully apparent. The need of a dynamo laboratory, suitable equipped, cannot be too strongly emphasized. Thus far there is not a single piece of alternating-current machinery about the department. A special appropriation for this purpose should be provided for at once. It is needless to say that the present equipment of the department is wholly inadequate for laboratory work in the new building."

An elective course in agricultural physics was introduced by Professor Hartman, and he considered that the results justified the action. It met each Saturday throughout the college year. A more modern textbook was introduced for use with the advanced physics classes. He recommended extension of the elementary course from one term to two terms as had Professor Eyer the year before. Assistant Hamilton was in charge of the wind recorder and was also required to teach some classes in mathematics. Professor Hartman considered that other provision should be made for this teaching of mathematics.

Professor Eyer carefully timed his leave of absence so as to return the fall of 1902 when the departments of physics and chemistry entered the new physical science building, later designated as Denison Hall. With the professor in the prime of life, and freshly brought up to date in the field of electrical engineering, and ample quarters in a new building, a pronounced development of interest and efficiency in the department was immediately registered. Assistant Hamilton was made assistant professor of physics in 1902, and Mr. Rueben F. Booth was employed as assistant in physics in 1903-4. He served as an assistant in mathematics the next two years, and as coach in athletics.

In 1903-04 Mr. Wm. Anderson, 1898, assistant in mathematics also gave some time to assisting in elementary physics.

Equipment installed 1902 to 1904 in the department of physics and electrical engineering included measuring-instruments of precision, and standard pieces of apparatus for the laboratories. Electrical engineering received special attention in the provision of dynamos, motors, alternators, rotary converters, transformers etc. Provision was made for general laboratory work in elementary and advanced physics, and for automatic recording meteorological instruments.

In 1904 William Anderson was transferred from the department of mathematics and became assistant in physics, and in 1905-6 Earnest A. Wright was student assistant in physics and surveying. During the biennial period 1904-06 considerable additions were made to the equipment of the department, and the number of students in the curriculum in electrical engineering increased to such an extent that Professor Eyer began presenting the need of a new building for he use of his department. One problem in this field was the need for conducting research while concurrently handling heavy teaching schedules.

In the Sixteenth Biennial Report 1906-08 Professor Eyer stresses more strongly the need for additional space. He also records the distinct demand by electric light and power stations for reliable tests and data on apparatus. Class and laboratory work with students had almost prevented research in the department. Several donations from manufacturers were received within this period, including a case of instrument parts form the Weston Electrical Instrument Company. Training was available for those wishing to enter the United States Weather Service and the government system of forecast display was in use.

William Anderson closed his connection with the department in 1906, and was succeeded by Oscar Hugo Halstead, 1895, who served until February 1, 1907. Wm. C. Lane, 1905, became assistant in physics January 22, 1907, and Kirk H. Logan was added September 1907. Student assistants during this biennium were Harry A. Ireland, 1907, and Albert D. Stoddard, 1906, from 1906-07, and Wm. L. Enfield, 1909, and Oliver H. Gish, 1908, from 1907-1908.

Effective July 1, 1908, the board of regents, March 19, 1908, divided the department of physics and electrical engineering, making B. F. Eyer professor of electrical engineering and J. O. Hamilton professor of physics. Wm. C. Lane became assistant in electrical engineering, and Kirk H. Logan assistant in physics. The departments continued to occupy essentially the same quarters in Denison Hall as previously. The department of electrical engineering was given supervision of all electric wiring and lighting at the college, and of the installation of electric motors except those in the power plant.

The biennial period ending June 30, 1910, is the last for which printed reports of the heads of the several departments of the college are available. It is not the present purpose to follow up fully the development of the department of electrical engineering, but it seems appropriate to do this briefly to the conclusion of the service of Professor Eyer. His report for 1908-1910 shows a healthy growth of the work of the department, the enrollment of students, and the contacts with outside power plants. Students were employed to a considerable extent on the electrical work in the college buildings, and on campus. A stock of electrical goods was kept on hand which was charged out at cost as used in other departments. Increases in the electrical courses in the curriculum in

electrical engineering were considered to make additions necessary to the teaching force. In addition to Messers, Eyer and Lane, a student assistant, Wm. L. Enfield, 1909, was engaged in the spring term, 1909.

Beginning with July 1, 1909, the deans began to function much more in the supervision and coordination of the work of the departments. President Waters, whose administration begat at that date, had been accustomed to a university administration in which deans played an important part, and he introduced the system here. In accordance with this usage he called for biennial reports from the deans for their respective divisions for the two years ending Jun 30, 1912, and made such use of them as he desired in preparing his report for the board of regents. Each dean used his own method in preparing his report, and departmental reports, if any, remained in his office, or at lease were not printed.

For the period 1910-1912 President Waters seems to have incorporated in his report to the board much or all of the reports of the deans. The report of the division of mechanic arts made by Dean E. B. McCormick gives little information concerning the individual departments. The section given to the Engineering Experiment Station shows that inquiries upon several phases of electrical engineering had received attention.

The First Biennial Report of the State Board of Administration, 1912-1914, included the report of President Waters, which was made up, on lines similar to those followed for the preceding biennium. Dean McCormick's report makes incidental references to the departments, and states that "the greatest present need of the division is for a building suitable to house the equipment in agricultural and electrical engineering."

Professor Eyer offered his resignation October 30, 1912. This was accepted, effective January 1, 1913, and Professor Hamilton was designated to act as head of the department of electrical engineering until a successor to Professor Eyer should be elected. He served in that capacity until September 1914, when the position was assumed by Professor Clarence E. Reid.

After his resignation Professor Eyer established himself in Kansas City Missouri, as a consulting electrical engineer.

With the assumption of the professorship of electrical engineering by Clarence E. Reid all connection in administration of the departments of physics and electrical engineering was finally terminated. They continued to be housed in the west wing of Denison Hall until 1921.

Lack of available space discouraged the undertaking of much research in physics, but special attention was given to developing instruction by means of carefully planned laboratory exercises.

In 1916 plans were make looking to the enlargement of the old Agricultural Hall, later named Education Hall, to provide for the department of physics. The legislature of 1917 made an appropriation of $50,000for this purpose, available during the fiscal year 1918-19. Owing to a great increase in building costs it became evident that the appropriation was inadequate and it was not drawn. In 1919 a change of plans was made and this sum was re-appropriated to be applied toward completing engineering Hall. In addition, $50,000 more was appropriated for the fiscal year 1919-20 and $90,000for the succeeding year.

The expenditure of these appropriations provided quarters for the department of electrical engineering in Engineering Hall, and the space vacated in Denison Hall was divided between the departments of physics and chemistry. This occupancy continued until the destruction of 'Denison Hall by fire, August 3, 1934.

The department of physics, after separation from electrical engineering was left in charge of all courses designated as physics, of whatever grade or scope. In a general revision of curricula made in the winter of 1908, the term of elementary physics which since 1894 had been part of the work of the freshman year for all students was replaced by a two-term course, Physics 1 and Physics 2. This greatly increased the teaching load. A one-year course, Physics 3, 4, and 5, was given for all juniors in engineering curricula or in architecture, and a different one-year courses, Physics 6, 7, and 8, was offered as an elective especially for students in the curriculum in general science. Physics 8 discussed especially the physical principles involved in meteorology.

September 1, 1909, James R. Jenness became assistant in physics. Within the biennium ending June 30, 1910, Charles Doryland, H. Morris, F. Parks and E.H. Dearborn were employed as student assistants in the physics laboratories.

In his biennial report for 1908-10, Professor Hamilton wrote:

> "Several lines of investigation have been followed by different members of the department and a method of treating "sulphated storage cells" completed. The method has been published and is now in use. Other lines of investigation begun should be completed in a short time.
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> "The work in photography now offered by this department has proved popular and of scientific value. The development of the field of practical physics would be made possible if more room were available. The crowded conditions of classrooms and laboratories in this and other departments using the Physical Science building makes a new building for this department an immediate necessity."

President Henry J. waters took office July 1, 1909, and before the close of his first year all the curricula were thoroughly revised. The entrance requirements were raised somewhat, being made equivalent to two years of high-school work. The sub-freshman course was increased from one year to two years. In this connection the Physics 1 and Physics 2, which had been elementary work in the freshman year for all students, were transferred to the sub-freshman course and extended to the full year, three terms.

At this revision a two-term course was provided for the student in the curriculum in home economics. This gave special attention to physical phenomena of special interest and importance to women, and to the physics of appliances used in the household. A one-term course was made a requirement for junior students in agriculture, a two-term course for general science students, and a three-term course for students in architecture and engineering. Three elective courses were provided, primarily for general science students. These were on radiant energy, physical measurements, and physical manipulations. A course in photography was also formally offered, but work in that art had been given previously.

In the Eighteenth Biennial Report, 1910-12, individual reports by department heads are not included. Instead of these President Waters used general divisional reports prepared by the deans. The report of Dean Willard includes the following paragraph:

> "The department of physics is in need of additional apparatus, some of which is of a very expensive character, but its most pressing requirement is that of a building, which might be shared with the department of electrical engineering. The need for this building is imperative, and a strong effort should be made to secure an appropriation of $100,000 for a building and its equipment. The space in Physical Science Hall that would thus be set free could be occupied at once by the department of chemistry, which would thus have ample room for its student laboratories, and for more efficiently conducting and enlarging the chemical work of the agricultural and engineering experiment stations, and the chemical control of foods, feeds and fertilizers which is in charge of this department."

Some revision of curricula appeared in the catalogue for 1910-11. That relating to curricular instruction in physics was limited to a reduction of the work required of young women in the curriculum in home economics. This was changed to be a four-hour course in Household Physics. The designations of all courses in physics were changed so as to be informational in respect to the content of each. The catalogue for 1911-12 discloses no further change in the courses in physics offered.

Mr. George E. Raburn was added to the physics staff in 1910, with the rank of assistant, and in 1911 Instructor Kirk H. Logan resigned, and was succeeded by Eustace V. Floyd with the same rank, and David G. Blattner was employed as an additional assistant.

Effective September 1913, the entrance requirements of the college were raised to fifteen units of acceptable high school work. Of these one unit in physics was required. The change in entrance requirements made revisions of all curricula necessary. Accompanying the action concerning college admission, the board of regents provided for the organization of a school of agriculture of sub-college grade, three years in length. This was intended to provide practical instruction in agriculture, mechanic arts and home economics for young persons who were not graduates of high schools, and in consequence could not enter the college itself. This school was not designed to serve as a preparatory school for the college, but its graduates were allowed a certain amount of credit toward college admission. In the application of high-school work to advanced credit in the curricula in the school of agriculture, and in accepting credits earned in the school of agriculture for admission to the college, twelve term credits in the school of agriculture were take as equivalent to one high-school unit.

Each curriculum in the school of agriculture included a year of elementary physics, and, as one unit of high-school physics was required for entrance to the college, the revised college curricula did not include the elementary physics previously given in the freshman year. The more advanced work required in the several curricula remained practically the same as before. Acoustics was offered as an additional elective course. Course offerings then remained unchanged until 1917.

During this period some increases and changes took place in personnel. The employment of Walter G. Allee as assistant in 1912 brought the staff to six in number. In 1913, Mr. Blattner resigned and Fred F. Piper was appointed to be an assistant. He served only one year, being succeeded by William H. Bair in 1914 who also served but one year. In 1915, John E. smith was appointed instructor, and Albert F. Baird assistant in physics. Instructor Jenness and Assistant Baird resigned in 1916 and Walter H. Pielemeier and F. Raymond Smith were appointed instructors. At this point therefore, during the year that the United States entered the World War, 1916-17, the staff consisted of Professor J.O. Hamilton, Assistant Professors E.V Floyd, and G.E. Raburn, and Instructors W.G. Allee, J.E. Smith, F.R. Smith and W.H. Pielemeier.

The Kansas legislature of 1913 passed a law reorganizing the control of the state educational institutions, and placing them under the State Board of Administration. The first report of this board was dual in nature being for its first year, but for two years for the institutions. It was entitled the "First Biennial Report of the State Board of Administration" and was for the biennial period ending June 30, 1914. The sections conveying the work of the respective institutions did not carry titles showing their serial relations to preceding biennial reports. In the case of the Kansas State Agricultural

College such a title would have designated this as the nineteenth biennial report. This report was prepared by President Waters and was general in character, though it incorporated material supplied by the deans. These reports of the deans were also rather general and did not necessarily carry formal reports concerning each department. Dean Willard's included the following statements:

> "Chemistry, physics and mathematics are essential in a system of education, in that the first two are fundamental in any thoroughgoing understanding or use of the biological sciences, as well as have important fields of direct application, while mathematics is the instrument though which all of the sciences are placed upon a quantitative basis and are thereby brought to the accurate and economical service of man. The work of these departments is constantly enlarging. The Department of Chemistry is responsible for chemical analyses in connection with several state offices and has a large part in the investigative work of the Agricultural and Engineering Experiment Stations. The department of Physics is hampered to an extreme degree by lack of suitable space for its work."
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> "The needs of the Departments of Physics, Electrical Engineering and Chemistry should be met by the erection of a commodious building that will provide for physics and electrical engineering."

The next year the board issued its second annual report, this covering the year 1914-15. It was general in character, and contained no reports for the presidents, and nothing concerning the department of physics. The second biennial report, 1914-16, of this board was similar in nature, but contains a paragraph emphasizing the need of a building for physics, in order that the department of chemistry "might have its proper place."

This second biennial report also carried reports prepared by the heads of the several educational institutions. These were not numbered, but the one by President Waters was the twentieth for this institution. In addition to some general statements

President waters incorporated material supplied by the deans concerning the divisions of the college. No specific reference is made to the department of physics.

The legislature of 1917 completely reorganized the management of the state institutions by placing all, educational, penal and charitable, under a single board designated as the State Board of Administration. This board replaced the one having the same name provided for four years earlier. This second board also published a "First Biennial Report of the state Board of Administration," which must not be confused with he one issued by its predecessor of the same name, four years earlier. This report for the years 1916-1918 contains this paragraph:

> "The last legislature appropriated $50,000 to enlarge the old Agricultural Building at the State Agricultural College and fit it for use by the physics department of the institution. Plans for the new addition and improvement were carefully drawn and bids secured for its erection, but all the bids were far in excess of the appropriation, and after careful consideration for the whole matter the Board and business manager, in consultation with College authorities and the state architect, finally decided to reject all bids and leave the money in the state treasure, with such further recommendations on the subject as may be found elsewhere in this report."

In the tabular presentation of the needs of the various state institutions there is included on page 42, a request for an appropriation of $80,000 for a "New physics building" and one for $75,000 for an "Addition wing to engineering building." As previously recorded in this paper, the legislature responded to this request by making appropriations totaling $190,000 for completing Engineering Hall, and the department of electrical engineering was transferred to that building, thus relieving to a certain extent the pressure on the departments of chemistry and of physics in Denison Hall.

This second board of administration attached to its general reports assembled reports of the administrative heads of the different state institutions. These were bound in

three sections, for educational, correctional and charitable institutions, respectively. On the title page of the educational institutions section, the names of the institutions are given, and under the name of each there appears in parenthesis a sort of sub-head indicating that it is a biennial report and giving its number. Under the name "Kansas State Agricultural College" there is a subhead "(Twenty-seventh Biennial)." This is an error, as it was the twenty-first biennial report. This error was perpetuated in the numbering of all later biennial reports, and consequently they have numbers six units too large in each case.

The so-called twenty-seventh biennial report of the college prepared by President Jardine includes the following paragraph, which supplements statements given elsewhere herein:

> "There has been for a number of years an imperative need of adequate housing for the department of physics, which is now occupying crowded quarters in the chemistry building, together with the department of electrical engineering. The last legislature attempted to provide for this need by appropriating $50,000 for an addition to the old agricultural building. Owing to the greatly increased costs of all building materials, as shown in the preceding table of commodity costs, the amount appropriated was found to be wholly insufficient. It was necessary to delay construction until the next legislature could be asked to provide an additional sum. It is asked that the sum of $50,000 be re-appropriated and $30,000 added for the construction of a physics building."

President Jardine also presented statements prepared by the deans concerning the work of the departments in their respective divisions. The department of physics received the following notice:

> "The department of physics has shared with the departments of chemistry and electrical engineering the great strain which the demand of the war for technically trained men has made. Classes in radio buzzer work have been conducted, which constitutes a contribution to the necessary war work of the nation. Classes in photography, of military value, have also been given and well patronized. The department has been prevented for making growth and

development by lack of room, and the appropriation allowed by the legislature in 1917 was not available until July 1, 1918, and because of the great increase in the cost of building materials and the price of labor it will be impossible to carry out adequate plans for increasing the space available for the department. It is highly important that an appropriation of $80,000, or more be made to provide for the necessities of the department of physics and electrical engineering."

The general part of the second biennial report of the board of administration for the biennium 1918-1920 has very little directly concerning this college excepting recommendations as to appropriations submitted through the business manager James A. Kimball. Among these was a request for a large increase in the item for salaries. Teachers in the department of physics in common with those in other departments of the college were suffering the situation created by the great advance in the cost of living without corresponding increases in salaries. The legislature in 1921 increased materially the appropriation for salaries although it did not meet the requests of the board.

This report, like its immediate predecessor, attached reports of the heads of institutions. President Jardine made a comprehensive showing of the increased cost of living for members of the faculty and of materials purchased by the college. Dean Willard made a statistical comparison for this report of teacher-class-student conditions in the departments of the division of general science. The situation in the department of physics is shown in this table:

		Teachers	Classes	Students
1917-18	1st Semester	6	37	609
1917-18	2nd Semester	5	39	539
1919-20	1st Semester	6	48	951
1919-20	2nd Semester	7	55	928

This illustrates post-war conditions, which required teachers to handle a greater number of classes, and greater numbers of students in the classes.

In this biennial report for 1920-22 President Jardine presented the need of a new chemistry building, which would "also give opportunity for expansion on the part of the department of physics." Abstracts of the reports of the deans were included in his report. Dean Willard mentioned that the department of physics had published a manual for use in general physics. The imperative need of adequate housing for the departments of chemistry and physics was again presented.

The state business manager, James A. Kimball for the year ending June 30, 1922, recommended "Overhauling the present creamery building, which is to be abandoned by the creamery department as soon as the new wing to the agricultural building is completed, in which quarters for this department are provided. This betterment consists of remodeling the interior and providing new equipment to accommodate the physics department, thereby relieving the over-crowded condition now prevailing in the chemistry department."

In the Thirtieth Biennial Report, 1922-24, President Jardine presented by means of elaborate charts the educational, research, and extensional activities of the college. The department of physics was shown to have in progress, research on:

Electronic structure of the atom
Projection efficiency of a three-point arc light
Protective value of fabrics used in clothing
Selectivity of sound resonators
Life of the dry cell
Radioactivity in gas-well borings
The effect of ultra-violet and other short wave radiations on plant growth

In his building program the president stated that a building costing $350,000 should be erected for chemistry, and Denison Hall turned over to the department of physics. He said, “In no other way can so much general relief be obtained in respect to classrooms.”

In connection with a presentation of the extensive public service of the college the department of physics was credited with advising by letter in respect to radio in 240 instances and in 50 cases of other technical matters.

The Thirty-first Biennial Report was prepared by President Farrell on very general lines, and contains no specific mention of the department of physics.

In the Thirty-second Biennial Report the department of physics is given credit for nine radio talks.

No special reference to the department of physics is made in the thirty-third, thirty-fourth, or thirty-fifth biennial reports, except that the last contains a discussion of the conditions affecting the departments of physics and chemistry arising form the burning of Denison Hall.