

Chapter Five

Physics Department Francis Cuyler Van Dyck (1880-1917)

Further Development of Rutgers College

After serving as President of Rutgers College for twenty years, William Campbell resigned in 1882 at the age of 73. He was succeeded by Merrill Gates, a layman, like A. Bruyn Hasbrouck and Theodore Frelinghuysen before him. A young man of 34 years of age, he came to Rutgers from the Albany Academy, where he had been Principal. He had been awarded the Ph.D. degree from the Regents of the State of New York in 1880. When Gates became President of Rutgers in 1882, there were 16 faculty members in the College, about half of them in science, mathematics, and engineering. There were 68 classical students, 43 scientific students, 6 special students, and 13 graduate students.¹

Merrill Gates believed that the American college should provide a liberal education and not focus on training specialists in any one area of knowledge. In his inaugural address he strongly advocated a strictly prescribed curriculum. He also believed that the highest aim of the College was the formation of a strong Christian character. Each Sunday morning he conducted a Bible class, which was compulsory for all students. Gates set out to improve the quality of the College. He encouraged the resignation of two professors of long service, whose work he questioned, and he reduced a third professor to part-time status. During the eight years of his administration, fifteen new faculty members were hired, none of them a clergyman, and nearly all of them with earned doctorates. Although the College carried out the obligations it had accepted as a land-grant college, the State provided no subsidy for this effort, and the income from the land-grant fund, less than \$7,000 per year, did not meet the increased costs of the Scientific School and the experimental farm.²

¹Demarest, *A History of Rutgers College*, 455; *Rutgers College Catalogue*, 1882-83.

²McCormick, *Rutgers: A Bicentennial History*, 112-117.

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After eight years as President of the College, Gates left Rutgers in 1890 in order to accept the presidency of Amherst College. Rutgers had come to be recognized as having a dual character, private and public, with features of both the classical college and the land-grant institution. When Gates left Rutgers, the Trustees chose Austin Scott as the next President of the College. Scott had received the Doctor of Philosophy degree from Leipzig. For several years he worked with George Bancroft on his *History of the United States* and on his *History of the Constitution*, and Scott came to Rutgers in 1883 as Professor of History and Constitutional Law. When Scott became President of Rutgers College in 1890, there were 24 faculty members and 197 students at the College. By 1890 nearly three-fifths of the College budget, apart from the budget of the experiment stations, came from Federal sources. That proportion of the budget increased, as the funds from the second Morrill Act grew larger. The salaries of only four professors came wholly from private funds; the salaries of the other professors came in whole or in part from one or another of the land-grant funds.³

In his inaugural address, Scott advocated a program that would carry scientific and technical knowledge from the college campus to farmers, artisans, and interested citizens in all parts of the State. His administration came to be dominated with concerns about relations between the College and the State.⁴ Louis Bevier implemented this plan for extension courses, and in 1892 courses in agriculture, astronomy, electricity and chemistry were given in six communities in the State. The program was expanded with more courses, but interest declined, and by 1900 the experiment ended, not to be revived until 1912.⁵

In 1905 the strain of financial and administrative responsibilities at the College brought Scott to resign his position as President. He was given a leave of absence for a year, after which he returned to his position as Professor of History and Political Science. William Demarest served for a year as Acting President, and in 1906 the Trustees chose him as the next President of the College. Demarest had graduated from Rutgers College in 1883, the first graduate of the College to be chosen President.

³McCormick, *Rutgers: A Bicentennial History*, 118, 119.

⁴Demarest, *A History of Rutgers College*, 456-475; *Rutgers College Catalogue*,

⁵McCormick, *Rutgers: A Bicentennial History*, 126.

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He taught for three years at the Rutgers Grammar School, and then attended the New Brunswick Theological Seminary, graduating in 1888. After graduation from the Seminary, he was a church pastor until he became Professor of Church History at the New Brunswick Theological Seminary in 1901. He was the Secretary of the Board of Trustees of Rutgers College when chosen to be Acting President in 1905.⁶

In 1905-06, when Demarest began his service, the undergraduate enrollment had grown slightly to 243, with an entering class of 84, and there were three graduate students enrolled. Although no longer the simple classical college of earlier days, Rutgers College was not yet a state university. It was, in fact, still quite small. Princeton had five times as many students; Harvard, Columbia, and several state universities had more than 4000 students; and even small colleges like Amherst, Colgate, and Lehigh had around 500 students.⁷

When the Rutgers Scientific School was established as the land-grant college in 1864, forty scholarships were created by the Trustees for students in the School. In 1888 the Trustees added ten more scholarships, and then provided free tuition to thirteen students certified by their county superintendents. Thus in 1888, of the 83 students enrolled in the Scientific School, 63 paid no tuition. In 1890 the Legislature passed a bill that would compensate Rutgers for each scholarship awarded. An initial payment was made the first year, and then, because of various disputes in the State and questions about the legalities of the payments, there were no further payments until 1905. The scholarships had an enormous impact on the relative balance between the classical and scientific departments in the College, since there were no scholarships for classical students.. In 1880 there were a total of 87 classical students and 40 scientific students in the College, while in 1892 there were 25 classical students and 71 scientific students in the entering class alone.⁸

In an effort to increase the number of classical students at the College, the Trustees decreed in 1909 that the courses leading to the degrees of B.A. and B.Litt. were to become courses in the Rutgers Scientific School. This brilliant scheme meant that the non-technical students

⁶Demarest, *A History of Rutgers College*, 498-501.

⁷McCormick, *Rutgers: A Bicentennial History*, 141.

⁸McCormick, *Rutgers: A Bicentennial History*, 120-136; *Rutgers College Catalogues*.

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would be eligible for State scholarships. As a result, the proportion of undergraduate students enrolled in the non-technical curricula rose from 25% in 1905 to 44% in 1915.⁹

The shift of the College away from its attachment to the Dutch Church proceeded slowly. In 1892 the Trustees of the College secured the consent of the Synod to change the requirement that three-fourths of the members of the Board of Trustees had to be communicants of the Dutch Reformed Church to two-thirds. In 1909 the requirements for the Trustees was dropped altogether, but the provisions that the President be a member of the Reformed Church and that there should be a Professor of Divinity remained.¹⁰

The movement of the College to become a state institution of higher education also proceeded slowly. The State Legislature made a significant step toward establishing Rutgers as the "State College" with an act in 1902 that required the Trustees of the State Agricultural College of New Jersey to establish a department of ceramics. The State provided \$12,000 to equip an appropriate laboratory, and \$2,500 for annual operating expenses. Apart from a partial scholarship payment of \$1,500 in 1891, this was the first actual appropriation of State funds for the operation of the College.¹¹

Finally, the State began to increase its support for the College. By 1906 there were regular appropriations for scholarships, for work in ceramics, and for short courses. In 1908 the State made a special appropriation to equip the new Engineering Building, and two years later the State made a similar appropriation for the Chemistry Building. In 1911 the State provided funds for equipment for courses in entomology and physics, as well as an increase in the number of state scholarships. In 1913 the State provided funds for the summer session, and in 1915 for the College Farm and for engineering and chemistry. In 1916 the State made appropriations to support the regular courses in engineering, sanitary science, chemistry, and military science, and a year later for education. By 1917 the State appropriation of \$120,700 accounted for approximately

⁹McCormick, *Rutgers: A Bicentennial History*, 144, 145.

¹⁰*Ibid.*, 127, 155.

¹¹*Ibid.*, 139.

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one-third of the total income of the College, with another third coming from Federal funds.¹²

Rutgers College Curriculum

Beginning in 1868, the students in the Classical School had been allowed to elect one class each term in the junior and senior years. Beginning in 1886, seniors were permitted to select two electives in each term. All students in the Scientific School took prescribed classes, which included chemistry, geology, natural history (physiology and botany), and natural philosophy. In addition, the civil engineering and mechanics students took prescribed classes in analytical geometry, differential and integral calculus, mechanics, engineering, and astronomy; the chemistry and agriculture students took prescribed classes in analytical chemistry, agriculture, mineralogy, mining and metallurgy, laboratory, and thesis. The Scientific School program was expanded in 1888 when the course in electricity was added to the course in civil engineering and mechanics and the course in chemistry and agriculture. In 1890 the courses in agriculture and chemistry were separated, and a course in biology was added.¹³

In 1891 the faculty revised the classical curriculum. The classical students continued to take the same prescribed courses in the first two years: Greek, Latin, German, English, mathematics, biology, chemistry, and history. In the junior and senior years there were three prescribed courses each term including French, mental philosophy, logic, ethics, physics, astronomy, geology, mineralogy, history of civilization, political economy, constitutional law, and art. The remaining two subjects were chosen from one of four major fields, defined as ancient languages, modern languages, mathematics and science, and history and philosophy. Whatever major field was chosen in the junior year had to be continued in the senior year, but there were no official grades for these elective courses.¹⁴

In an effort to increase the number of students in the non-technical courses, the faculty introduced in 1901 the Latin-scientific course, in which Greek was dropped both as an entrance requirement and as a

¹²McCormick, *Rutgers: A Bicentennial History*, 153, 157.

¹³*Rutgers College Catalogues*.

¹⁴McCormick, *Rutgers: A Bicentennial History*, 128, 129.

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prescribed subject in the curriculum. In place of Greek, candidates for admission were required to present evidence of two years of modern languages and two years of physics and chemistry. The Latin-scientific course differed from the classical course only in that French and physics were substituted for Greek in the first two years, and the degree awarded was Bachelor of Letters rather than Bachelor of Arts. The course attracted a few students. Between 1905 and 1915, 68 Litt.B degrees were awarded, compared with 116 A.B. and 400 B.Sc. degrees.¹⁵

In 1907 the general science course was created, which permitted students to pursue a liberal, non-technical, curriculum without having to study either Latin or Greek. This course led to the B.Sc. degree. In the three non-technical curricula (A.B., Litt.B., B.Sc.) there was a prescribed program of studies in the freshman year, but in the following years approximately half of the program consisted of electives. The three-term calendar was replaced by a two-semester system, and courses were given numbers and listed in the College Catalogue according to departments. By 1907 the *Rutgers College Catalogue* had grown to over 200 pages. At that time mechanical engineering was separated from civil engineering. In the 1908-09 *Catalogue*, there was a listing of four one-semester courses in astronomy, one of them still required for the classical students, and six one-semester courses in physics, one of them still required for all students.¹⁶

By 1912, disciplinary boundaries had become more important, and academic ranks were differentiated. Before 1900 most faculty members at Rutgers College were full professors. Between 1906 and 1916, the teaching faculty expanded from 31 to 81. As the faculty expanded, the ranks of instructor, assistant professor, associate professor, and professor became the pattern.¹⁷

In 1916 the faculty carried out another revision of the curriculum. There were minor changes in the technical curricula in the Rutgers Scientific School, separating the different programs in the freshman year, and providing less time for non-technical subjects. Military science was required of all freshmen and sophomores. There were more substantial

¹⁵McCormick, *Rutgers: A Bicentennial History*, 129, 130.

¹⁶*Ibid.*, 144, 145; *Rutgers College Catalogues*.

¹⁷McCormick, *Rutgers: A Bicentennial History*, 149, 150.

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changes in the liberal arts curriculum. The new curriculum established group requirements, arranged in seven fields, and students were required to take varying numbers of hours of study in each group, depending on their curricula. The seven groups included: English; science and mathematics; history, political and social science; philosophy, psychology, and education; art and architecture; and military science.¹⁸

The old elective arrangement was changed to a system that required concentration on majors and minors in the junior and senior years. The major consisted of six hours of work in one subject through two years, while the minor involved two related subjects through two years. The majors were botany and plant physiology, chemistry, classical languages, English, German, Greek, history, Latin, mathematics, physics, political science, Romance languages, and zoology and physiology. With this curricular revision, the distinction between the classical curriculum, the Latin-scientific course, and the general science course faded away.¹⁹

The graduate program at Rutgers developed very slowly. In 1881 the Trustees ended the practice of routinely awarding the master's degree to all graduates three years after they received the bachelor's degree, a practice common in nearly all American colleges of the time. From then on, alumni who graduated from professional schools of theology, law, or medicine, or who presented other acceptable evidence of intellectual progress, could apply for a master's degree three years after graduating with a bachelor's degree. A large proportion of graduates who were eligible, applied for and were awarded advanced degrees during the next forty years. In 1882 the Trustees endorsed a set of faculty recommendations for the awarding of advanced degrees in course. Advanced students could receive the degree of Master of Arts or Master of Science after spending a year in residence taking approved courses, passing a comprehensive examination, and presenting a satisfactory thesis. Students could receive the degree of Doctor of Philosophy or Doctor of Science after a two-year course of study involving subjects in two related disciplines, together with an examination and a thesis.²⁰

¹⁸*Rutgers College Catalogues.*

¹⁹McCormick, *Rutgers: A Bicentennial History*, 145, 213.

²⁰*Ibid.*, 99.

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A small number of students enrolled for postgraduate studies, but few of them earned graduate degrees for several years. There were two graduate students each year from 1880 to 1883. The first Ph.D. at Rutgers in any field was awarded in 1884, and the second in 1912. The first earned M.Sc. degree was awarded in 1893 for work in course, and the second in 1915. By 1915 no Master of Arts degrees had been awarded. William Demarest, who became President in 1906, encouraged departments that had the necessary staff and facilities to accept graduate students. In 1912 a faculty committee established requirements for the doctoral program to include three years of study, knowledge of French and German, a general examination, and a thesis. Within a few years, aided by several industrial fellowships, there were a score of graduate students in residence, mostly in agriculture, but with some in chemistry and biology.²¹

Physics and Astronomy

It is appropriate to identify the beginning of the Physics Department at Rutgers College with the appointment in 1880 of Francis Cuyler Van Dyck as the first Professor of Physics. Van Dyck was born in Cocksackie, N.Y., in 1844. At age 14 he entered the Union School in Schenectady, N.Y., to prepare for college. While at Union he spent his extra time in the locomotive works and machine shops of the father of George Westinghouse. He entered Williams College in 1861, and after a year, transferred to Rutgers College as a sophomore. He graduated from Rutgers College in 1865 with the A.B. degree. At graduation he received the Suydam Prize of Natural Science. The Rutgers Scientific School opened in 1865, and Van Dyck enrolled as a graduate student in chemistry, the first graduate student at Rutgers College. As a graduate student, he studied chemistry with Professor Cook, while voluntarily assisting him in the preparation of his lectures. At that time there were no formal courses for graduate students, and provision had not yet been made for “earned” graduate degrees.²²

The following year, 1866, the College appointed Van Dyck Tutor in Chemistry. As Tutor, he taught mathematics, surveying, physiology, zoology, and botany, in addition to chemistry. He even taught a few terms

²¹McCormick, *Rutgers: A Bicentennial History*, 148; *Rutgers College Catalogues*.

²²“Francis Cuyler Van Dyck”, *Rutgers Alumni Monthly*, May 1927, 219.

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of French and German. In 1870 the College arranged for Van Dyck to spend a year of advanced study in Europe, at his own expense, in preparation for taking up a professorship in the College. On his voyage to Europe, the Franco-Prussian War broke out, disrupting some of his study plans. He spent his time in Europe consulting with chemists and physicists at Berlin, Vienna, Aix la Chapelle, and Wiesbaden. He studied mining at Freiberg and at institutions in England. Interested in the technology of science, he visited the observatories at Greenwich, Berlin, and Halla, and the Woolwich Arsenal, the Royal Mint at Vienna, and the great Tubular Bridge at Menai Straits.²³



Figure 16 Francis Cuyler Van Dyck

Van Dyck returned to Rutgers in 1871 to become Professor of Analytical Chemistry. He assumed full charge of the courses in inorganic chemistry, and became Professor of Inorganic Chemistry in 1878 when Peter Austen became Professor of Analytical Chemistry. In 1880 Van Dyck became Professor of Physics and Inorganic Chemistry, and in 1882 Professor of Physics and Experimental Mechanics. He received the honorary Ph.D. degree from Union College in 1888. Rutgers conferred on him the honorary degrees of D.Sc. in 1910 and LL.D. in 1915. Van Dyck was seriously interested in his field of knowledge and kept abreast of the latest developments in his field. As a microscopist and chemist, he was

²³“Francis Cuyler Van Dyck”, *Rutgers Alumni Monthly*, May 1927, 219.

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called to give testimony in civil and criminal cases. Although he taught a number of subjects, three or four at a time, physics became his major subject of study about the time that electricity was generating industrial applications. Van Dyck was a close friend of Thomas Alva Edison in Edison's early days at Menlo Park, and Van Dyck directed his own attention to the study of electricity. He was among the first of the American professors to convey to students the new world of electricity with all of its potential for service.²⁴

Although Van Dyck does not appear to have been an active researcher, on at least one occasion he was included among some of the country's most distinguished physicists. By 1884, electrical devices were taking an increasingly important place in the American scene. Edison was applying for patents at the rate of 300 patents in 4 years. In 1883 Edison patented the passage of electricity from a filament to a plate of metal inside an incandescent lamp globe, the forerunner of the electron tube. The Franklin Institute in Philadelphia responded to the development of electrical equipment by organizing an International Electrical Exhibition to be held at a national conference of electricians in the fall of 1884.

A commission of distinguished scientists was appointed to conduct this national conference. Francis Van Dyck was invited to this commission, along with such notables as Henry Rowland from Johns Hopkins, J. Willard Gibbs from Yale, John Trowbridge from Harvard, and astronomers Simon Newcomb and C. A. Young. The letter of invitation to the commission came from Frederick Theodore Frelinghuysen, Secretary of State, on behalf of the President of the United States, Chester Arthur. Secretary of State Frelinghuysen was a graduate of Rutgers in the class of 1836, the grandson of the first Rutgers tutor, Frederick Frelinghuysen, and the nephew of Theodore Frelinghuysen, President of Rutgers College (1850-62). Although these connections may have been partly responsible for Van Dyck's appointment to this prestigious commission of greatly distinguished physicists, it is also a fact that Van Dyck had a genuine involvement and interest in the area of electricity.²⁵

²⁴*Rutgers Scarlet Letter*, 1890; "Francis Cuyler Van Dyck", *Rutgers Alumni Monthly*, May 1927, 219; Demarest, *A History of Rutgers College*, 416; McCormick, *Rutgers: A Bicentennial History*, 94; *Rutgers College Catalogues*,

²⁵Rukeyser, *Williard Gibbs*, 273-277.

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For a number of years, Van Dyck had volunteer students in electricity, and then in 1888, he established the course in electricity in the Scientific School. For some years, Van Dyck's Department was designated the Department of Physics and Electricity. The undergraduate students in the new electricity course took most of the courses in the program in civil engineering and mechanics, but also took some courses in electricity especially designed for them. There were also two graduate students in electricity between 1887 and 1890. Some of Van Dyck's students went on to become pioneers and leaders in the fields of electrical service and manufacture.²⁶

Between 1889 and 1908 Van Dyck was assisted in the course in electricity by a succession of faculty members with short-term appointments. Martin Wyckoff served for a year as Adjunct Professor of Physics and Laboratory Assistant (1889-90). He had graduated from Rutgers in 1872, and became the second graduate student at Rutgers College in 1877-78, without specification of a specific area of study. Following, Wyckoff, two of Van Dyck's sons assisted him as Instructors in Electrical Science. These sons were Francis Cuyler Van Dyck, Jr. (1898-99), 1894 graduate of Rutgers, and William Van Bergen Van Dyck (1899-1901), 1896 graduate of Rutgers. In 1908 the course in electricity became the program in electrical engineering. Frank Thompson, who had assisted Van Dyck with the course in electricity for five years, was appointed Professor of Electrical Engineering, and took over responsibility for the electrical engineering program.²⁷

Until 1909, Van Dyck taught the physics courses to the classical and scientific students without help. In 1909 the Physics Department expanded to two full-time faculty members with the appointment of Frank Pratt as Instructor in Physics. Pratt graduated from Warsaw College in N.Y., and joined the Rutgers staff in 1903 as a drafting assistant. He received the B.Sc. degree from Rutgers in 1906, and was a graduate student for a year. He was Instructor in Mathematics and Graphics in 1907-09, and became Instructor in Physics in 1909. He became Assistant

²⁶“Francis Cuyler Van Dyck”, *Rutgers Alumni Monthly*, May 1927 219; Raven, *Catalogue of the Officers and Alumni of Rutgers College*, 42, 51, 53, 141, 310-311; *Rutgers College Catalogues*.

²⁷*Rutgers College Catalogues*.

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Professor of Physics in 1911. In 1917 he received the Ph.D. degree from Princeton and was promoted to Associate Professor, and then Professor of Physics in 1921. Following Pratt's appointment there was a succession of faculty members with short-term appointments, who assisted with the physics instruction. These faculty members with short-term appointments, included William Linn (1913-15), Mayne Mason (1915-17), and Morell Baker 1916-17.²⁸

As the responsibilities of the College President increased, the Trustees created the position of Dean of the College in 1901 in order to relieve the President of the burden of dealing with matters of student discipline. A student board had been set up to deal with such matters, but it did not adequately take care of the student discipline problems. Francis Van Dyck was appointed to the new position of Dean of the College, a position equivalent to the present day Dean of Students. He received an addition of \$250 to his salary, but no reduction in his teaching duties. Because of his long involvement with the College as a student and faculty member, his high principles, his kindly disposition, and his common sense and good humor, he was felt to be an excellent choice for the new position. He was affectionately known as "Poppy." At times he referred discipline cases to student committees or to the faculty, but, more frequently, he dealt with the student problems himself. Van Dyck continued as Dean of the College until 1912, when he was replaced by Louis Bevier.²⁹

The first graduate student in physics was William Miller (1883-84), who had graduated from Rutgers in 1883. The first graduate student in astronomy was Asher Atkinson (1892-94), who had graduated from Rutgers in 1885. There were two graduate students in mathematics and physics, Edwin McKeagg (1896-97) and Frank Pratt (1906-07), both graduates of Rutgers. Between 1887 and 1903, there were four graduate students in electricity, studying with Van Dyck. These graduate students in electricity, all graduates of Rutgers College, were Henry Palmer (1887-88), Sam Schanck (1889-90), William Van Dyck, son of Francis Van Dyck, (1896-97), and James Read (1902-03). None of these students

²⁸*American Men and Women of Science*, 1927 edition; *Physics Today*, April 1954, 21.

²⁹McCormick, *Rutgers: A Bicentennial History*, 134, 152; Demarest, *A History of Rutgers College*, 488.

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earned advanced degrees, although some received the semi-automatic masters degree.³⁰

Initially, Van Dyck's Department was located in one room of Geology Hall, which had been completed in 1872. By 1909 the Physics Department occupied seven rooms on the main floor and three rooms in the basement of Geology Hall. There were two lecture rooms, an office, an apparatus room, a general laboratory, a battery room, and a laboratory for work requiring constant temperatures. Just to the left of the front entrance of Geology Hall was a small workshop where Van Dyck made much of his apparatus. The lecture apparatus included such instruments as a dividing engine, a set of United States weights and measures, metric standards, a spherometer, and a planimeter. There also was a steam engine, a gas engine, electric motors of various kinds, a storage battery, a model Edison three-wire plant of about two hundred light-bulb capacity, a full set of electrometers, galvanometers, and rheostat. In 1911 the State provided funds to better equip the physics laboratory in the basement of Geology Hall.³¹



Figure 17 Robert Prentiss

³⁰McCormick, *Rutgers: A Bicentennial History*, 99; Raven, *Catalogue of the Officers and Alumni of Rutgers College, Rutgers College Catalogues*.

³¹Miller, "Tributes to 'Poppy' Van Dyck," *Rutgers Alumni Monthly*, June 1927, 249; *Rutgers College Catalogue*, 1900; McCormick, *Rutgers: A Bicentennial History*, 153, 157.

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Although Van Dyck took up the physics instruction in 1880, the instruction in astronomy remained in the Mathematics Department until 1932. George Merriman had been Professor of Astronomy from 1877. When Merriman went to Middlebury College in 1891, Robert Prentiss became Associate Professor of Mathematics and Astronomy. Prentiss received the B.Sc. degree from Rutgers in 1878. As an undergraduate at Rutgers he had received prizes in mathematics from an intercollegiate association that conducted contests in mathematics. Prentiss spent two years as Fellow at Johns Hopkins (1879-81), and was Assistant at the *Nautical Almanac* (1881-91). He came to Rutgers in 1891 as Associate Professor, and later Professor of Mathematics and Astronomy. For several years he was designated Director of the Schanck Observatory. He died in 1913.³²

When Prentiss died in 1913 he was replaced by William Breazeale. Breazeale graduated from Furman University (1885), and received the B.Sc. degree from Rutgers (1889). He was Instructor in Mathematics at Rutgers (1892-95), Acting Associate Professor of Mathematics (1902-05), and Associate Professor of Mathematics (1905-13). In recognition of his role in the astronomy program, Breazeale was named Professor of Mathematics and Astronomy when he replaced Robert Prentiss in 1913.³³

Francis Van Dyck retired in 1917 and became Professor Emeritus. He had been at Rutgers College for 55 years since coming as an undergraduate student in 1862. He had served on the faculty for a total of 51 years, and was the first and only Professor of Physics for 37 years. He had lived and served under five different Rutgers' Presidents, and he was said to be the favorite professor of more classes of students at Rutgers than any other faculty member. He was loved by the students and was especially dear to his faculty colleagues because of his kindly and congenial personality. In 1922 a handsome stone porch was built for the east entrance of Geology Hall in honor of Van Dyck. At his death in 1927, he was highly honored by students, faculty, and administrators at Rutgers. The new physics building, which was nearing completion at the time of his

³²Demarest, *A History of Rutgers College*, 449, 450, 476; *American Men and Women of Science*, 1910 edition; *Rutgers College Catalogues*.

³³Raven, *Catalogue of the Officers and Alumni of Rutgers College*, *Rutgers College Catalogues*.

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death, was named in his honor. Today a portrait of Van Dyck hangs in the office of the Physics Department Chair.³⁴



Figure 18 Portrait of Francis Cuyler Van Dyck

Physics and Astronomy Curriculum

In 1880 all classical and scientific students took two terms of natural philosophy in the junior year, using the textbook by Deschanel. Beginning in 1882 *the Rutgers College Catalogue* listed courses in physics rather than courses in natural philosophy, and all classical students were required to take a third term of physics in the senior year. According to the *Catalogue*, these courses were accompanied by frequent lectures, which were “amply illustrated by the use of an extensive supply of apparatus and instruments.” The students in the Scientific Course studied physics from the French edition of Ganot's larger treatise on physics. Beginning in 1890 the students in the Classical Course studied physics from the English version of Ganot's textbook on physics. Steward and Gee's *Practical Physics* was also used in 1890. In 1907 Carhart's *University Physics* was used, and in 1911 Reed and Guthe's *Physics*.³⁵

³⁴Demarest, *A History of Rutgers College*, 541; *Rutgers College Catalogues*; “Francis Cuyler Van Dyck”, *Rutgers Alumni Monthly*, May 1927, 219.

³⁵*Rutgers College Catalogues*.

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In 1880 the classical students and the civil engineering and mechanics students took one term of astronomy in the junior year, using Newcomb and Holden's *Astronomy*.³⁶ This astronomy textbook covered the celestial sphere and the relation of the earth to the heavens, motions of the earth and planets, universal gravitation, the solar system in detail, comets, and constellations. In 1884 Loomis' *Astronomy* was used, followed by Young's *Elements of Astronomy* in 1889. Instruction in astronomy made use of the equipment of the Schanck Observatory, which was equipped with a 6½-inch equatorial telescope, a transit circle, a sidereal clock, and other astronomical instruments. Theoretical and practical astronomy was available as an option for classical students in the senior year, also making use of the facilities of the Schanck Observatory.³⁷

The following course descriptions appeared in the *Rutgers College Catalog* for 1900:³⁸

“CLASSICAL SCHOOL”

“MATHEMATICS AND ASTRONOMY PROFESSOR PRENTISS, MR. MORRIS”

“ASTRONOMY.—General astronomy [*Young's Elements*] is taught during the second term to all members of the Junior Class. The daily recitations are supplemented by lectures on the new astronomy and modern methods and instruments of astronomical research. These lectures are illustrated by photographic lantern views obtained from the leading observatories of the world.

ELECTIVE ASTRONOMY.—Mathematical and Practical Astronomy may be pursued as an elective study in combination with Mathematics throughout the Junior and Senior years. The course then includes:

Introduction to Mathematical Astronomy.

Theory and Use of Instruments.

Method of Least Squares.

Practical Work in the Schanck Observatory.

This course is designed to give the student training in the theory and use of instruments of precision, and to enable him from his own observations of the heavenly bodies to solve various important problems in the applications of Astronomy: the Determination of Time, Longitude, Latitude, Direction of the Meridian, etc. Considerable attention is paid to methods of calculation and to the reduction of observations.”

“PHYSICS.

PROFESSOR VAN DYCK.”

³⁶Newcomb and Holden, *Astronomy*.

³⁷*Rutgers College Catalogues*.

³⁸*Ibid.*, 1900-01.

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[Three terms of Physics (Ganot) are required of all students in the Junior Year.]
“This subject is taught by lectures, and copious additions are made to the matter of the text-book. Each point is demonstrated as far as possible; and the relations of the subject matter to ordinary natural phenomena, the processes of the industrial arts, etc., are pointed out. Students are trained to distinguish the essential from the casual conditions of the experiments, as well as to infer from scientific data no more than is certain and warranted. The course begins with Mechanics and proceeds to Heat, Electricity, Sound and Light.

The apparatus is adequate for the illustration of all principles, and such additions are made to it as the industrial applications of science demand.

ELECTIVE PHYSICS.—During the Senior year of the Classical Course Physics is an elective study.

The object of this elective is to furnish a sound, practical foundation to those who expect to engage in industrial pursuits, or in professions which demand acquaintance with the principles of Physics. The work consists of a course of laboratory exercises such as is set forth in Gee's Practical Physics, besides many of the experiments described in the text-book used in the lecture course. The facilities of the Physical Laboratory have been greatly increased, so that all essentials are available to students.”

There were similar course descriptions for students in the Scientific School. For the students in the course in electricity there were also required classes in electricity and magnetism throughout the Senior Year.³⁹

Until the 1916 curriculum revision, physics and astronomy were required for all students in the College. Following the revision, physics and astronomy were no longer required, but could be elected as part of the group requirements, and a student could “major” in physics, and “minor” in astronomy. Before the 1916 curriculum revision, the College offered four (one-semester) advanced physics courses, in addition to the introductory courses. After the curriculum revision, there were seven advanced physics courses, including electricity and magnetism, electrical instruments, light, heat, and general laboratory. The two semesters of theoretical and practical astronomy, which had been given for many years, continued to be listed in the *Catalogue* after the curriculum revision, but were not offered between 1916 and 1920.⁴⁰

³⁹*Rutgers College Catalogues.*

⁴⁰*Ibid.*