1908-2008: A CENTURY OF PHYSICS AT OREGON STATE UNIVERSITY

By Ken Krane

The teaching of physics (then known as "natural philosophy") began in Corvallis College as early as 1866 under Reverend Joseph Emery, who held the post of Professor of Mathematics and Natural Science (as well as being in charge of the "Young Gentlemen's Boarding House" and serving as Acting President in 1872). In 1872 Corvallis College became the State Agricultural College, and a School of Physics was established, comprised of the Departments of Chemistry, Biology, and Natural Philosophy. Its leader was Benjamin L. Arnold, A. M., who was at various times Professor of Physics, Professor of Moral Philosophy, Professor of English, Professor of Languages, and director of the Agricultural Experiment Station (and who would later become president of the college from 1872 to 1892). During the 1890's, only introductory physics courses were offered, at various times through the Department of Chemistry, Physics, Geology, and Mineralogy, the Department of Physics, History, Latin, and Music, and the Department of Mechanics, Physics, and Mechanical Engineering. The physics instructor for much of this time and through 1908 was Grant Covell, M. E., who was Professor of Mechanical Engineering. The introductory physics courses supported degree programs in engineering, commerce (business), pharmacy, forestry, and agriculture.

The formation of an independent physics department began in 1908 with the hiring of Dr. Willibald Weniger as Assistant Professor of Physics. Weniger (originally from Milwaukee, Wisconsin) received B.A., M.S., and Ph.D. degrees from the University of Wisconsin and was hired by OAC immediately upon completing his Ph.D. dissertation on infrared absorption spectra. At that time he was the only Ph.D. on the faculty of the college. He left OAC in 1914 to work at the research laboratories of General Electric and returned in 1920 to resume the post as head of the Physics Department. He served as head of Physics until 1949, and after retiring in 1951 he spent 4 years as head of Physics and Electrical Engineering at the University of Alaska. He returned to Corvallis in 1955 and died in 1959.

During Weniger's absence from 1914 to 1920, Dr. William Anderson (Ph.D., University of Wisconsin, 1906) was appointed as head of the Physics Department. Through this period, the offices and laboratories of the Department of Physics were housed in Apperson Hall (now Kearney Hall). The department still offered only introductory courses in support of various undergraduate major programs. In addition to Weniger or Anderson, the department employed usually two additional instructors.

Starting in 1920, the department faculty consisted of Professors Weniger and Anderson along with 6 instructors, including the first woman hired by the department, Mrs. Charlotte Taylor (A.B., Vassar), who was in charge of teaching Household Physics in support of the Home Economics degree program. The number of courses had grown slightly, but almost all were introductory courses for students in various majors. Several courses in photography were added in the 1920's; because the department owned a great deal of photographic equipment that supported the laboratories for these courses, the

Physics Department ran the College's Photo Service for many years, and physics staff and students did the photo processing for the institution. (The remnants of this association were apparent in the old Photo Service facilities which were formerly housed in the area that is now the Paradigms classroom.)

Also added in the 1920's were courses in telegraphy, which gradually morphed into courses in radio communication. Eventually the Physics Department started the campus radio station KOAC, which was operated by the department until 1932 when the State of Oregon (through the Board of Higher Education) assumed responsibility for the station. Graduate thesis credits were first offered in the 1920's, although no curriculum of graduate physics courses was available.

In 1928, the Physics Department moved to new facilities in what is now known as Covell Hall (and was then known as the Physics Building), with KOAC occupying most of the 3rd floor of the building. By 1930 the Physics Department had grown to a faculty of 12 (3 professors, 9 instructors) within the School of Basic Arts and Sciences, which offered no undergraduate majors and awarded no degrees (but undergraduate degrees in some areas such as chemistry and zoology could be earned through the School of Agriculture).

The early 1930's brought great changes to the College and the Department. The State System of Higher Education consolidated its course offerings, and as a result the undergraduate and graduate degree programs in all of the sciences were offered only at Oregon State. These included the B.A./B.S., M.S. and Ph.D. in physics. A full range of undergraduate and graduate courses was offered to support the physics degree programs, and from that time the catalog listings for physics began to resemble the present-day listings. Course offerings in physics went from 70 credit hours to 232 credit hours. Unfortunately the widespread economic depression resulted in severe hardships for the campuses, and the physics instructional staff was reduced from 12 to 7.

In 1936 (at which time Oregon State Agricultural College became Oregon State College) the first 2 students enrolled in the graduate program and served as instructors for the introductory courses. The number doubled the following year, and the first doctoral degrees in physics were awarded in 1939-1940.

The years of World War II (1940-1945) saw many of the faculty applying their scientific expertise in support of the war effort. Professors James Brady, Harold Vineyard, and Ed Yunker spent the war years doing radar research and development at MIT and Harvard. Professor David Nicodemus, who would join the department in 1950, participated as a graduate student in the atomic bomb development at Los Alamos.

In the late 1940's, the department began a research and instructional program in meteorology, which would eventually evolve into the Department of Atmospheric Sciences. In 1949, Ed Yunker assumed the post of department head following the mandatory retirement of Willibald Weniger, who had served as chair since 1920.

By 1950, the physics faculty comprised 9 professors and 12 instructors. Work was begun on the construction of a 37-inch cyclotron under the leadership of Professor James Brady, who had worked with cyclotron pioneer Ernest Lawrence at the University of California. The cyclotron became operational in 1954 and ran until 1966 when funds were received from the Atomic Energy Commission for an upgrade. The cyclotron continued to operate until the early 1970's. The main magnet from the cyclotron is now serving as a bending magnet for the TRIUMF accelerator in Vancouver, BC.

By the early 1960's, when Oregon State College became Oregon State University, the department had grown to 12 professors, 3 instructors, and 40 graduate assistants. In 1959, the department began its move into the new Physics-Chemistry Building, soon renamed Weniger Hall after former department head Willibald Weniger. After the completion of the second stage of the building, the official dedication was held in 1962. Among the speakers at the ceremony were Nobel chemist Willard Libby, Nobel physicist Ed McMillan, and Homer Newell, NASA Director of Space Sciences. At the dedication, the building was described as "one of the largest and best equipped science research and teaching centers in the U.S."

The first undergraduate degree in Engineering Physics was awarded in 1962 through a cooperative program between the Physics Department and the College of Engineering. In the late 1960's, the photography courses were given for the last time. Meteorology courses formerly given by Physics were transferred to the new Department of Atmospheric Sciences, along with the faculty whose specialty was in that area.

In 1972, the faculty of the Physics Department decided that it would be more efficient if the department's research were focused with roughly equal effort in 3 areas: atomic and optical physics, condensed matter physics, and nuclear physics. This policy was used in the ensuing decades to guide faculty hiring. As a result of retirements and resignations, 5 new faculty were hired between 1973 and 1976, and 7 faculty hires were made between 1986 and 1991. These faculty brought a new energy to the department's teaching and research programs and established an enviable record of external grant support. As a result, graduate enrollments swelled to 80 students by 1991, and from the mid-1980's to mid-1990's, the department awarded on the average nearly 25 undergraduate degrees per year, placing it consistently among the top 5% of U.S. universities.

As a result of declining undergraduate enrollments beginning in the mid-1990's, the department began a careful examination of its degree programs, which resulted in the launch of the Paradigms project in 1997. This project involved a wholesale reconfiguring of the physics courses of the junior and senior years. Once the program was established, enrollments of physics majors (which had fallen to about 10 per year from 1995-1999) rose to around 20 per year in the following decade. These successes brought OSU attention as one of the 20 model U.S. programs surveyed by the National Task Force on Undergraduate Physics. An outgrowth of the Paradigms program was the establishment of a viable research program in physics education. During this same period, the department established a new undergraduate major in Computational Physics and awarded the first degree in 2003.

Following a series of retirements, 7 new assistant professors joined the department between 2001 and 2008. These newly hired faculty injected a level of enthusiasm that is reflected in new directions for research. The character of research in physics has changed in recent decades, from individual scientists working largely in isolation to large collaborative projects involving dozens of researchers from many different fields of science and engineering. The development and study of new types of materials and the exploitation of structures on the nanoscale have opened new vistas for research, to which the OSU Physics Department is poised to make significant contributions as it enters its second century.