PHYSICS AT TULANE UNIVERSITY

Karlom Riess

The present Tulane University had its origins in the Medical College of Louisiana (1834) and the University of Louisiana (1847). In 1850 Claudius Wistar Sears, a graduate of the United States Military Academy, was appointed professor of mathematics and natural philosophy, and also dean of the Collegiate (undergraduate) Department of the University of Louisiana. Sears offered a senior level, one semester course in natural and experimental philosophy, which was followed by a one semester course in astronomy. His course included the rudiments of mechanics, hydraulics, hydrodynamics, acoustics, optics, electricity, magnetism and chemistry. Applications of chemistry to the arts and to agriculture were presented in special lectures. Sears was cited by the Board of Visitors of the University of Louisiana for his excellent teaching — for "thoroughly indoctrinating his students into the principles of science."

During the War Between the States all departments of the University of Louisiana were closed. The Medical and Law Departments were reopened immediately following the War, but financial and personnel problems beset the University, preventing full-scale operation. No undergraduate instruction corresponding to the old Collegiate Department was available until 1878. In that year James Lucius Cress was appointed professor of mathematics and natural philosophy, serving for two years. His course was patterned after the Cambridge Course of Natural Philosophy.
Brown Ayres, a graduate of Stevens Institute, was appointed professor of physics and mechanics (as well as acting professor of chemistry) in 1880. The University Catalogue stated that the Department of Physics had been added after a considerable financial outlay for apparatus. The introductory course was at the junior level, and used Atkinson's Genet's Physics as a text. The relationship of each division of the course to the "grand fundamental principle of the conservation of energy" was stressed. Ayres introduced demonstration lectures and many new laboratory experiments.

A second (senior) course was offered, consisting of analytical mechanics, potential theory, the mechanical theory of heat and general mathematical physics. Ayres also gave a series of fifty lectures "to the mechanics of the city on the application of physics to machinery and the mechanical arts." Programs for a B.A. degree and an M.A. degree with a major in physics were set up. Additional courses were added annually.

From 1850 - 1882 the Physics Department was housed in the main University Building, situated facing Common St., in the downtown business district of New Orleans. The Department was moved to the old Mechanics' Institute in 1882. A new laboratory course was then added, emphasizing the determination of physical constants and the use of instruments. In addition the students were given instruction in the method of least squares and in the use of graphical methods.
The University of Louisiana became, through legislative and administrative transfer, the Tulane University of Louisiana in 1884. The Annual Catalogue for 1884-1885 contains eight pages of description of the physics courses and apparatus available. Ayres had purchased excellent equipment, some of which is still in the Department today.

With the change of name came a reorganization of the College. Physics was made a requirement in three curricula—three years in the mathematical program, two in the natural science program, and two in the mechanical (engineering) program. Three different basic physics courses for undergraduates were offered. The increased load necessitated the employment of an instructor, first filled by William van Phul (1890) and later by Douglas Smith Andersen (1892). Andersen had been a graduate student in the Department of Physics, receiving the M.A. degree. He will be remembered as Dean of the School of Engineering.

The relocation of Tulane University from its original site to the present campus began in 1894. By 1894 Ayres was given the responsibility of planning and designing a new Physics Building. The new building was completed in 1895. It was designed to face due South, and had other special features, such as no iron within the building, piers set into the ground independent of the framework of the building, slate slabs for instruments, etc. In the time of construction it was the only laboratory built exclusively for physics.
At the turn of the century the Department of Physics major program consisted of twenty-two semester hours of physics in both the B.S. and B.A. programs. Twelve semester hours of physics were required in other degree programs. The general physics courses were now offered in the sophomore year, with specialized courses in the junior and senior years. A full program of graduate courses was offered by Ayres, Andersen and James Adair Lyon of Newcomb College.

James Adair Lyon came to Newcomb College in 1900, and served for forty-one years as professor of physics and head of the Newcomb College Physics Department. He continued for almost twenty years more as professor of astronomy in other divisions of the University. Lyon was the first W.R. Irby Professor of Physics (1933). During Professor Lyon's years of service the departments of physics in the College of Arts and Sciences and in Newcomb College were separate entities. Only on the graduate level were the two divisions merged.

There was little progress from 1905 to 1920. Samuel Jackson Barnett, a Cornell Ph.D., became professor of physics and head of the department in 1905. Barnett was a good research man, but not a teacher or administrator, with the result that the affairs of the department were handled in a somewhat chaotic fashion. Even the registrar had difficulty in securing grades for his students. Local merchants frequently lodged complaints for non-payment of bills for materials furnished the department.

J. Harry Cle succeeded Barnett in 1911, serving until 1920. Curiously, on his appointment as head of the department, his academic rank was assistant professor. He is best remembered for
setting up a radio-telegraphy school in the Department of Physics during World War I.

Daniel Stanley Elliott, a graduate of Johns Hopkins, was appointed professor of physics and head of the Department in 1920. The basic philosophy of his department was that the emphasis should be on superior teaching. This is not to say that Dr. Elliott was not interested in research, but he recognized the limitations of Tulane, both as to staff and finances, and believed that good teaching was of more value to Tulane than research.

One of the accomplishments during the early years of the Elliott administration (1922-1923) was the building and operation of an amateur radio station, with call letters WAAC. Joseph Chandler Morris and William Pendleton Lehde were the moving spirits in this venture. Morris was an instructor in the department, and Lehde, a lecturer on radio design. This was the first collegiate radio station in the United States.

Elliott, assisted by Walter C. Beach and E. Scott Barr, strengthened the undergraduate program by the introduction of courses in "modern" physics. The hours required for the major were increased. In July, 1943 Tulane was one of the universities awarded a Navy V-12 Program. World War II was in progress, and the entire teaching program of the College of Arts and Sciences was revamped to meet the specifications of the Navy Program. Physics was a required course. Additional staff members were added, including the author. Representatives of other University departments (classical languages, geology and philosophy) were given special training in physics so they could be used as
laboratory instructors.

Walter C. Busch and E. Scott Barr were appointed acting heads of the Department on the death of Dr. Elliott in 1944. Joseph Chandler Morris, a Tulane physics graduate and a Princeton Ph.D., joined the Newcomb College faculty as a visiting professor in 1939-1940. During World War II he was engaged in government work and was on leave a large part of the time. Dr. Morris was appointed department head in 1945, serving until June, 1960.

There was a shift in emphasis during the Morris administration. There was more experimentation and individual research by staff and students, but with continued emphasis on good teaching. As the years progressed this led to the acquisition of research contracts and special projects.

A course in biophysics for pre-medical students was first offered in 1945-1946. A research program in biophysics, with private financing, was instituted in 1947, with Robert T. Nieset of the University of Michigan as director. The program was a joint effort of the College of Arts and Sciences, Newcomb College, the School of Medicine and the Graduate School of Medicine. The first Army contract secured was for the construction of a Kier-type mass spectrometer for radioactive tracer work. The second was for the construction of a double focusing mass spectrometer. The research staff of the biophysics program worked closely with the various hospitals of New Orleans in setting up isotope laboratories.

The biophysics program was expanded to the area of applied physics. Experimental work was divided into the following sections:
photomechanical, photochemical, radiation and radioactivity, electronics and mass spectrometry, biophysics and metabolism. A microwave laboratory, an electron microscope laboratory, an ultracentrifuge laboratory and a blood and circulation laboratory were added. Unfortunately with changes in the University administration and faculty, and the inability to secure proper financing for the work, the biophysics program has been curtailed in recent years, with the radiation laboratory the only remaining division. This laboratory is no longer a part of the Department of Physics.

Another accomplishment of the Morris years was the construction and operation of the first amateur television station, first of its kind in New Orleans. Sending and receiving equipment were built by students, and the station placed in operation during 1946-1947.

Dr. Morris was appointed vice-president of the University in 1948, in addition to his duties as department head. In 1960 Robert T. Nieset succeeded Dr. Morris as head, serving for two years. Under Dr. Nieset's direction the department became more research-oriented. A Ph.D. program in physics was added during his term. The orientation of the department shifted to nuclear physics and solid state physics.

Charles Leroy Peaceock served as head of the department from 1962 until 1972. The graduate program was strengthened, with the first doctorates awarded in August, 1963. The three recipients were Lionel Dureau, now head of the Department of Physics at L.S.U., Noah Daniel Veith, head of the Department of Physics at Nicholls State University, and William Bernard,
Professor of Physics at Louisiana Tech University.

Beginning in the 1960's the Department of Physics admitted career United States Army Officers as candidates for advanced degrees under special programs. These men have formed a major part of the graduate program. The undergraduate major requirements have been raised, and are currently 36 semester hours.

A new research facility was added in 1967. This was the Riverside Research Laboratory at the F. Edward Hebert Center near Belle Chasse, La. The nuclear physics laboratory is located in one of the ammunition bunkers of the old Navy ammunition depot. The bunker contains a Van de Graaf accelerator, related experimental equipment, a machine shop and related facilities. The accelerator was purchased with funds made available by the Percival Stern Foundation of New Orleans and the National Science Foundation.

The Department of Physics of the College of Arts and Sciences and the Department of Physics of Newcomb College were merged in 1971 with the moving of both departments into the new Percival Stern Science Center. The new building contains departmental offices, faculty offices, graduate student offices, research rooms and teaching laboratories, but no facilities for lecture classes. At the same time the Cunningham Observatory was placed under the jurisdiction of the Department of Physics. The Physics staff is now responsible for all astronomy courses in the University. Lecture classes for physics and astronomy are now held in the Observatory.
Robert Kerriss, a long-time member of the Newcomb College Physics Department, was appointed University Chairman of Physics in 1969. He has been active in the unification of the two departments, and in the promotion of a strong research program. The current head of the Department of Physics in the College of Arts and Sciences is Frank Durham. Dr. Durham joined the staff in 1960. He is currently on leave, and will take over his new duties in 1975.