I entered office at a time when new interdisciplinary educational programs were beginning to flourish. Notable enterprises such as Oriental and South Asia Regional Studies had been in the Graduate School for some time and more recently American Civilization had developed. [..] [By 1952] a program of International Relations had taken its place in the Graduate Catalogue, as well as those developed in the field of Foreign Policy Research Institute and the Albert M. Greenfield Center of Human Relations. Interdepartmental Group Committees have developed significantly during the years. Their range has broadened to include Economic History, Engineering Mechanics, City Planning, Regional Science, Biomedical Electronic Engineering, Microbiology, Molecular Biology, Religious Thought, History and Philosophy of Science, Operations Research, Applied Mathematics, Architecture, Demography, Clinical Sciences, and an Institute of Neurological Sciences. Under purposeful administrative policy following the recommendations of the University Survey, departments have continued to be systematically rebuilt. This work is a constant process and the departments listed are but illustrations of a broader program of university strengthening.

As the University of Pennsylvania approaches the twenty-first century, its students and faculty alike enjoy an extraordinary array of intellectual and career opportunities. With four colleges and twelve graduate and professional schools on a single campus, Penn is one of only a handful of American institutions of higher learning able to support interdisciplinary study through joint and dual degree programs, submatriculation programs, and multi-disciplinary graduate groups. Undergraduates take classes across the course offerings of all four colleges and select fully integrated, highly structured programs leading to productive careers or graduate and professional training at the most competitive levels. Graduate and professional students may pursue advanced study and research not only in an established field, but also with the scholars who are advancing knowledge in virtually every arena of human endeavor. Over the past half century, nothing has been as transformative in Penn's institutional life as the development and achievements of interdisciplinary investigation and learning. Nor has any other advance been as significant in strengthening Penn's standing among American research universities. As students and parents, faculty and administration, alumni and Trustees celebrate today's graduation ceremonies, all friends of the University may find it interesting to know more about the people and policies instrumental in directing Penn's academic enterprise to this point.

The University of Pennsylvania of the twentieth century - a research institution, dedicated to the advancement of knowledge - actually began to take form between 1881 and 1894, under the visionary provostship of William Pepper, M.D. In 1882, Pepper established the Graduate School of Arts and Sciences and at the Commencement of 1889 he awarded Penn's first Ph.D. In the five years which followed, the Graduate School faculty awarded doctorates in no fewer than thirteen subject areas: Botany, Chemistry, Economics, English, Germanic Languages, History, Mathematics, Mineralogy, Philosophy, Physics, Psychology, Semitic Languages, and Transportation and Commerce. Even so, Provost Pepper's innovations did not immediately change his institution's identity.

One hundred years ago, as it had been throughout the nineteenth century, Penn was principally a university of professional schools. At the Commencement of 1899 the Provost conferred a total of 618 degrees, more than three-quarters of which were awarded to graduates of the Schools of Medicine, Law, Dentistry, and Veterinary Medicine. In addition, the University conferred undergraduate professional degrees in Architecture, Biology, Chemistry, Chemical Engineering, Economics, Electrical Engineering, Mechanical Engineering, and Music. Only forty-eight undergraduates took their Bachelor's degree in today's equivalent of the College of Arts and Sciences. The Graduate Faculties conferred just twenty-five Masters and Doctor of Philosophy degrees. Today the College of Arts and Sciences and the Graduate Faculties award approximately two-fifths of all University degrees. At the Commencement of 1899 they awarded just one-tenth.

Pepper's contemporaries accepted and advanced his conception of the Arts and Sciences at the core of the modern University. In 1897, his successor, businessman, political mover, and philanthropist Charles Custis Harrison, named William Romaine Newbold, a 32-year-old assistant professor of philosophy, to the post of Dean of the Graduate School. Newbold, though eventually considered a specialist in Plato, Aristotle and the pre-Socratic ancient philosophers, was then early in a multi-disciplinary career and active not only in the subject area of philosophy, but also in archaeology, the history of religion, psychology, and Semitic languages. Within a few months of his appointment, Newbold established the graduate group structure that exists to the present day. The University's annual report for 1897 described the reform:
The twenty-nine 'authorized subjects' have been abolished and the instruction given has been arranged in sixteen 'groups'. [...]
Each group comprises those courses of study which are so closely related in theory and practice that a student taking any one would probably wish to do some work in the others. [...]
All persons authorized to give instruction within a group constitute the Group Committee. To the several Group Committees are entrusted the arrangement of their respective courses, and the oversight of students taking majors within the group.

Newbold's reorganization conferred formal institutional recognition upon academic disciplines and in such a manner as to provide for future redefinition and expansion. Pepper's work was almost entirely preserved. Among the thirteen subject areas in which the Graduate School had conferred doctorates under Pepper, eleven became independent graduate groups under Newbold. Newbold's own group committee in Philosophy retained control over Psychology (which would wait until 1909 to obtain its independence as a graduate group) and the graduate group in Economics retained control over all the fields of business, applied economics, and social sciences, including Transportation and Commerce (which continued until 1965). To the eleven graduate groups which remained, Newbold added American Archaeology and Languages (renamed Archaeology and Ethnology in 1899 and secondly, in 1909, Anthropology); Astronomy; Classical Languages; Indo-European Philology (which, in 1947, on the retirement of its longtime chair, merged into Oriental Studies); and Romance Languages. Twelve of Newbold's sixteen graduate groups continue in existence today. If Pepper ushered in the age of the research institution, then Harrison and Newbold demonstrated the maturing of academic disciplines.

The Graduate School flourished. The graduate groups established in 1897 served the faculty well, as both intellectual and administrative units of organization. In the decade which followed, significant numbers of fellowships and scholarships were established and the enrollment of graduate students more than doubled. So too did the number of doctorates awarded. In 1908, the faculty established a graduate group in Fine Arts, offering a Ph.D. in art history. A year later, Lightner Witmer, director of Penn's pioneering Psychological Laboratory and Clinic, became the first chair of the graduate group in Psychology. In 1910, the Executive Committee established a graduate group in the Medical Sciences, composed of the chairs of the Medical School departments of anatomy, bacteriology, chemistry, pathology, and physiology. The Medical Sciences group awarded its first Ph.D. in 1912 and has evolved over the intervening decades to become today's Biomedical Graduate Studies program, offering doctorates in seven fields of the life sciences.

In the same year the Graduate School expanded to incorporate research in the basic biomedical sciences, Morris Jastrow, Jr. introduced Penn to the concept of interdisciplinary studies. Jastrow, the son of Rabbi Marcus Jastrow of Germany, had earned the Bachelors degree at Penn in 1881 and the Ph.D. at the University of Leipzig in 1884. Appointed to the faculty of the Graduate School in 1885, he was named professor of Semitic Languages in 1891. Said to be fluent in as many as twenty ancient and modern languages, Jastrow was a man whose scholarship was so brilliant and so widely respected that many consider him Penn's leading intellect of the early twentieth century. In 1908, Jastrow announced a new course on "Elements in the Study of Religion, togeth­er with a general survey of the History of Religion," which he recommended be taken in conjunction with courses offered by the graduate groups of Anthropology (Primitive Religions), Classics (Latin 4: The Literature of Christianity), and History (Church History). Jastrow believed there was "a growing demand for courses in the History of Religions" and the response to his course would prove it. He was right and within two years his colleagues were prepared to join him.

In early 1910, the Executive Committee of the Graduate School at Penn formed a "special Graduate Committee" on the History of Religions. Jastrow was careful to note that the rise of modernism in the study of religion had already brought about similar programs at Harvard, Yale, Cornell, and Columbia. The discoveries of archaeology and the technique of higher criticism of religious texts had made possible "a scientific method for the study of religious phenomena." The History of Religions group at Penn would include faculty whose expertise was in the general history of reli-
gions, the Semitic religions, Egypt, India, Persia, Greece and Rome, Teutonic religions and certain phases of the early history of Christianity. It also would include faculty from other disciplines: anthropology, ethnology, history of philosophy, and ethics.

For twenty years the History of Religions stood out among the graduate groups at Penn. When Jastrow died in 1921, at the all-too-early age of 60, the University recruited Rev. Dr. George Aaron Barton from Bryn Mawr College to succeed him. Barton was a Harvard-trained Ph.D., a member of the American Philosophical Society, a Fellow of the American Association for the Advancement of Science, an acclaimed scholar of Semitic languages, and a great writer and teacher on the history of religion. Under his chairmanship the graduate group in the History of Religions continued its leadership. The extraordinary nature of its interdisciplinary course was celebrated in The Graduate School Announcement for 1930-1931:

History of Religion is in effect a group of Groups. The study of religion demands a rich equipment in many branches of learning, anthropological, historical, philological, philosophical. In a modern university, this learning is available in ample measure; but its range is so vast that the elements composing it must be sought in many different departments originally organized for independent projects of research. Twenty years ago the University conceived that the student whose personal interest or whose professional program carried him deep into matters of religion, might be served by finding collected in one place and under few headings those of its courses which would guide him in research or prepare him for teaching in this domain. [...] Since it is obvious that no one scholar would undertake to master the whole of this learning, the acquisition and use of which is essentially a cooperative effort, the departments whose courses are here listed have entrusted the guidance of the student to a small advisory committee whose function will be to [...] act as his counsel throughout the course of his studies. Here the definition of interdisciplinary studies is fully articulated, even if the term itself was not yet in use. Scholars from different academic disciplines could combine resources to address an intellectual problem or theme. Working collaboratively, faculty could form an autonomous group committee outside the bounds of traditional degree programs. Through shared research and teaching, faculty and their students alike could work more efficiently toward the advancement of knowledge. Exciting, new fields of discovery would burst forth and the academy and society at large would both benefit. Two long-term issues, however, were always part of the picture. An interdisciplinary program might be launched on the basis of an emerging academic opportunity and the enthusiasm of genuine collegial rapport, but its proponents also would be required to demonstrate entrepreneurial skill. Unless such a program developed an active and accomplished group of scholars who could act as its advocate and unless it acquired an ongoing stream of income, its life would be finite.

By 1930, the winds of change were blowing over the History of Religions group. Under two scholarly provosts, Edgar Fahs Smith (1911-1920) and Josiah Harmar Penniman (1920-1939), the arts and sciences had grown enormously at Penn. In 1928, the number of graduate groups stood at twenty-seven and the cumulative total of doctorates conferred by the graduate group faculty topped a thousand. Within a few years, the Dean of the Graduate School would request a re-organization and in 1936 the graduate groups were divided into "quadrants": the Biological-Medical Sciences, the Humanities, the Physical Sciences, and the Social Sciences. Those graduate groups that represented generally recognized academic disciplines began to be more formally known as departments. Departments grew accustomed to the distinctiveness of the subject.
matter and the research methods of their own discipline. Differing academic cultures, in some respects, fundamental differences, were confirmed by the new quadrants.

Professor Barton turned 70 in 1929 and stepped down from the chair of the History of Religions a year later. His successor placed anthropology and psychology outside the History of Religions major and divided the group into Western philosophy and religions on one hand and Semitic, Indian, and Chinese religions on the other. Within the graduate group of Semitic Languages, the faculty had recently added specialists in Indian and Chinese studies. In 1931, the Department of Oriental Studies was established, absorbing the graduate group in Semitic Languages and taking under its wing the group in Indo-European Philology. To the distress of Barton and others, this combination of Middle Eastern, South Asian, and East Asian scholars was not an interdisciplinary group, but a uniting of humanists in related fields. The History of Religions effectively became an adjunct of the Department of Philosophy, where it remained until it closed after the 1944-1945 academic year. Morris Jastrow's experimental course of 1908 had paid great dividends at Penn, but its core subject area, the study of the religions of the world, no longer seemed capable of attracting a critical mass of faculty and students. This was to be a very temporary state of affairs, for Edwin E. Aubrey arrived on campus in 1949 as Professor of Religious Thought and immediately began the organization of the Religious Studies group. A precedent was nevertheless established, that if the intellectual reasons for maintaining an interdisciplinary program lose their power, the program should be allowed to die.

Even as the History of Religions group was being dismantled, an extraordinary new group appeared among the Medical Sciences. In 1929, the Eldridge R. Johnson Foundation for Medical Physics established the new discipline of biophysics at Penn. The 1930-1931 Graduate School Announcement described the course leading to the Ph.D. in the following terms:

Opportunity for graduate study and research in Biophysics is offered by the Johnson Department of Medical Physics. Seminary courses in the medical and biological aspects of Optics, Acoustics, X-rays, Radioactivity, Bioelectric Phenomena, and Thermodynamics are open to students who have had a satisfactory training in the physical principles of these several fields. After the satisfactory completion of such preliminary courses, well qualified students may arrange to carry out investigations in any phase of the subject approved by the staff. Unusual research and clinical facilities are available to the medical graduate who desires to do advanced work leading to a higher degree in this pioneer field.

The Johnson Foundation funded the construction of the biophysics laboratory in the new Maloney Building at 36th and Spruce Streets. Detlev W. Bronk, later president of Johns Hopkins University and Rockefeller University, was the first director. Bronk was an engineer and physicist, who was also trained in physiology. Under his direction Penn's Department of Biophysics was the first to apply "the laws of physics to biological and medical problems." Bronk soon established close ties to medical research in neurology and in the late 1930s, in particular, his lab made major contributions to the study of the human nervous system and became internationally renowned for its leadership in neurophysiology. Bronk's successor, Britton Chance, was a biologist, who also had a doctorate in electrical engineering. Chance developed a spectrophotometer that enabled scientists to make great advances in cell physiology. In their design and construction of medical instruments, Penn's biophysicists helped revolutionize the study of biological systems.

In the 1940s, Biophysics was joined by other life sciences in the fusing of disciplines made possible by rapidly advancing technology. The introduction of the electron microscope brought about the formation of an interdisciplinary graduate group in Microbiology. Announced in 1948, this group brought bacteriology, botany, and zoology together in a single research mission, the study of the fundamental biology of microorganisms. Wesley G. Hutchinson, Associate Professor of Botany, was chair, but the group's senior faculty member was David R. Goddard, Professor of Botany, and later, from 1961 through 1970, Provost of the University. Goddard also was instrumental in developing the interdisciplinary graduate group in General Physiology, along with Merkel Jacobs, the School of Medicine's Professor of General Physiology. That group was regarded as one of the nation's best. Between 1950 and 1957, the graduate groups in Microbiology and General Physiology conferred eleven doctorates, helping create an entirely new generation of research scientists.

As a result of these successes, a consensus had formed by 1950 on the need for an interdisciplinary oversight group, one that applied the tools of the physical sciences to the needs of the life sciences. Interscience was the name of this group and its members included Goddard, Britton Chance, and S. Reid Warren, Professor of Electrical Engineering. The Graduate School Bulletin for 1951-52 described the group's purpose:

Since more and more research problems in the biological-medical sciences require effective attack the techniques and interpretations of the physical sciences, investigators in those fields will increasingly need fundamental training in the physical sciences. At the same time, workers in the physical sciences will find enhanced opportunities for research in the biological-medical fields. To further the interaction between the physical sciences and the biological-medical sciences, the Graduate School has established a graduate advisory committee in Interscience (the physical-biological-medical disciplines). Graduate students in the physical sciences and in the biological-medical sciences who are interested
in these opportunities will be encouraged to include in their doctoral programs course work in the area not of their original training.

By encouraging graduate students "to select research problems necessitating associations in both the biological-medical and the physical sciences" and promising its advice and consultation, the Interscience group effectively pioneered interdisciplinary research and training at the highest level of graduate and professional education at Penn.

Interdisciplinary programs in the humanities and social sciences also advanced in the late 1930s and again a decade later. A graduate group in American Civilization was formed in 1937, "for those who wish to specialize in the field of the development of social and cultural institutions." The program aimed initially at Ph.D. candidates "who wished to combine the study of history with analysis and understanding of the forms of expression which mark the intellectual and cultural development of the nation." Arthur Hobson Quinn, the John Welsh Centennial Professor of English Literature, and Roy Franklin Nichols, Professor of History (and later Dean of the Graduate School), were the two faculty members principally responsible for the formation of this group. In 1942, the graduate group expanded to include political science among its core disciplines. Under the late Anthony N. P. Garvan, who arrived at Penn in 1949 and later became the first Professor of American Civilization, the study of material culture was added to the Department's offerings as well as courses in literature, the arts, and statistical analysis. By 1960, when American Civilization achieved departmental status, the program had evolved into "a distinct area studies discipline grounded in cultural anthropology."

While American Civilization evolved into an area studies program, it was the graduate group in South Asia regional studies, under W. Norman Brown, Professor of Sanskrit, which established the modern, interdisciplinary, area studies model at Penn. During World War II, the Army Specialized Training Program made Penn the national center for training servicemen in the language and culture of India. In 1947, with funding from the Language Fund of the American Council of Learned Societies and the Viking Fund, Brown offered a six-week, summer session program entitled "India: A Program of Regional Studies," consisting of four courses "in ancient and modern languages, historic Indian civilization, and modern India." Nine months later, the new graduate group for South Asia Regional Studies made the following announcement in the University Bulletin for 1948-49:

South Asia Regional Studies, by virtue of being set up as a regional program, may be chosen as a major under any one of the following departments: Anthropology, Economics, Fine Arts, History, Linguistic Analysis, Oriental Studies, Political Science, Sociology. The University of Pennsylvania, in cooperation with the Carnegie Corporation and the Rockefeller Foundation, is initiating this year a full-time program of regional studies dealing with India, Pakistan, and neighboring areas, including Iran and Southeast Asia. The program will provide comprehensive and integrated coverage of the environment, culture, art, anthropology, history, languages (including Indo-Aryan, Iranian, and Dravidian), economics, and the political and social sciences of the respective individual areas within the general region of Southeast Asia. Students majoring in this program will be working toward their degrees under one of the departments listed above, with South Asia as their particular major. This work will be supervised jointly by the Regional Studies group and the department concerned. …

Brown's success in winning the support of the Carnegie and Rockefeller foundations was essential, of course, to his accomplishment. It enabled the South Asia program to recruit faculty across a broad range of the humanities and social sciences. They, in turn, attracted able students and in its first decade, the South Asia program awarded 18 M.A. and Ph.D. degrees.

The advance of interdisciplinary research also came from the President and Trustees of the University. Harold E. Stassen, President from September 1948 through January 1953, when he joined the Eisenhower administration, worked hard to establish "an ambitious and possibly unique program of graduate education designed to prepare exceptionally gifted young men and young women for public service on a policy-making level." As a result, two graduate groups - Human Relations and International Relations - owed their start, at least in part, to the interest and support of Stassen.

In the summer of 1951, Stassen and Everett R. Clinchy, President of the National Conference of Christians and Jews, jointly announced the establishment of the Albert M. Greenfield Center for Human Relations at Penn. The Center
defined its mission in terms which recalled the warning of W.E.B. DuBois, a half cen-
tury earlier: "The urgent need to improve the
quality of human relations in our
country has been stressed as the out-
standing problem in our democratic life. A uni-
versity dedicated to the advancement of
knowledge and to the education of people
to render more effective service as citizens
and as members of their respective profes-
sions has a special responsibility to bring its
resources to bear in solving human rela-
tions problems. [...] The basic idea of a
Center for Human Relations is to bring
together these resources [...] and those of
the surrounding community." The
Center’s Executive Committee consisted of
two representatives of the National
Conference of Christians and Jews, two
from the University, and two from the
“community at large.” They recruited
Martin W. Chworowsky, Professor of
Education at Columbia University, as the
first Director of the Greenfield Center and
the first Professor of Human Relations at
Penn. They chose well.

Martin Chworowsky was a graduate of
Harvard College and Harvard Law School,
but never practiced law. Instead, he
became an educator, earning M.A. and
Ph.D. degrees at the University of
Pittsburgh while he served as principal of
its Falk School. He accepted an appoint-
ment at Carnegie-Mellon and was promot-
ed to Associate Professor of Education and
Psychology before moving to the Teachers
College at Columbia. He arrived at Penn
in September 1951 and immediately began
teaching courses on inter-group relations,
emphasizing the contributions to be made
to the field by at least half a dozen social
sciences. In the University Bulletin of April
1952, Chworowsky defined the Greenfield
Center’s graduate program as the
University’s response to the great issues of
tension and violence, of prejudice and dis-
 crimination which exist between people
who differ from one another in race, reli-
gion, ethnic identification, and socioeco-
nomic class. He saw the reduction of these
problems and the improvement of inter-
group relations as intellectual challenges
that would require contributions from a
broad range of social sciences:

The increasingly widespread recognition
of the urgent need to bring our ability to
control social components of our civiliza-
tion more nearly abreast of our achieve-
ments in the control of the material com-
ponents has led to concentrated efforts to
advance sound knowledge of social rela-
tions and to prepare people more ade-
quately to deal with problems of human
interaction. Among the problems to be
faced are those arising from tensions
among groups because of racial, religious,
etnic, and other differences. [...] It has
never been more essential to emphasize
the necessity for a cooperative, interdisci-
plinary approach to these social problems.

An interdisciplinary approach involves
not only cooperation among scholars in
the various social science disciplines, but
also among them and the practitioners in
the related fields. Adequate programs to
advance knowledge and training in inter-
group relations must include the whole
range of relevant interdisciplinary experi-
ence, stressing the various aspects as the
needs in a specific problem area indicate.

In the late 1950s, the Center turned its
attention to “Frontier” problems, including
changing urban neighborhoods, inter-relig-
ious conflicts, civil liberties, and employ-
ment. The enduring significance of the
Center was recognized in 1963, when the
Albert M. Greenfield Foundation provided
it with a generous endowment. The
endowment subsequently enabled the
University to create the Albert M.
Greenfield Professor of Human Relations.
The first to hold the chair was Louis H.
Pollak, who was appointed Professor of
Law at Penn in 1974 and who later served
as Dean of the Law School. The Center
itself is known today as the Greenfield
Intercultural Center, with offices in
International House, at 3708 Chestnut
Street.

Nineteen fifty-one also was the year when
the interdisciplinary program in

International Relations first appeared at
Penn. Its founder was Robert Strausz-
Hupé, Associate Professor of Political
Science, who sought to prepare graduate
students for professional service in several
different fields of international affairs. The
program aimed to train men and women
not only “for careers in public international
administration, including diplomatic ser-
vice,” but also in “international commerce
and finance; teaching of public and inter-
national affairs; international research and
intelligence; and community organization
and public information on world affairs.”

In addition to a core curriculum in politi-
cal science, students were expected to study
economics, finance, geography, history,
sociology, and foreign language. The gradu-
ate group faculty was composed of more
than 25 members, representing the disci-
plies just mentioned and area studies pro-
grams as well, including South Asia region-
al studies, Oriental studies, and Chinese
studies. Enrollment in International
Relations boomed. By 1957 the program
had conferred 46 M.A. degrees and one
Ph.D., with 25 more students enrolled for
the academic year 1957-58.

These nine pioneer interdisciplinary pro-
grams of the first half of the twentieth cen-
tury pioneered the intellectual rationale
and laid the institutional foundation for
Dean Nichols, Provost Goddard, and their
successors to launch many times that num-
ber over the fifty years that followed. The
entire academic world now acknowledges
both the elegant beauty and compelling
nature of joint and dual-degree programs,
of submatriculation programs, of interdisci-
plinary and cross-disciplinary graduate
groups. It is their ready utility in address-
ing academic problems and their adaptabil-
ity for application to the very real needs of
humankind that makes them such a suc-
cessful organizational model. One hun-
dred years after Provosts Pepper and
Harrison, Penn has surely fulfilled their
dream. On Commencement day 1999 we
may look forward with confidence to the
twenty-first century.