

Notre Dame



Sorin

J. A. Zahm

J. W. Cavanaugh

Burns

Charles O'Donnell

Kirsch

Nieuwland

Wenninger

man and



Edwards

Egan

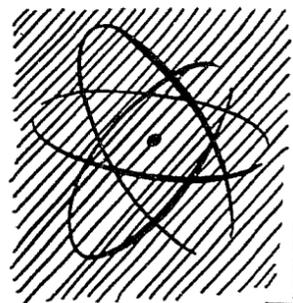
Hoynes

Albert Zahm

Green

Rockne

his world



Gurian

Barth

FATHER WILSON ASSIGNED TO ND FOUNDATION

Rev. John J. Cavanaugh, C.S.C., has been granted an indefinite leave of absence from his post as director of The Notre Dame Foundation and head of the University's \$66,600,000 development program, it was announced recently by the office of Rev. Theodore M. Hesburgh, C.S.C., Notre Dame president. Father Cavanaugh has been suffering from a chronic vascular ailment.

Rev. John H. Wilson, C.S.C., administrative assistant to Father Hesburgh, has been named acting director of the Foundation, Notre Dame's fund-raising organization. He will coordinate all the University's public relations and development activities.

The University also announced the appointment of Rev. Thomas J. O'Donnell, C.S.C., to a newly created alumni liaison post. Father O'Donnell, who has been associate director of the Foundation, will travel widely in his new assignment, meeting at regular intervals with Notre Dame's 175 local alumni clubs in this country and abroad.

Father Cavanaugh served as Notre Dame's president from 1946 to 1952, and he has been the University's principal public relations and development officer since 1953. The Notre Dame Foundation, which he established during his presidency in 1947 and which he has actively led during the past six years, has received more than \$30,000,000 in gifts and grants. Fifteen major buildings have been erected on the campus since the Foundation was inaugurated twelve years ago.

Father Wilson, a native of Chicago, Ill., was appointed administrative assistant to the president of Notre Dame in 1958. Previously, he had served for two years as assistant director of the Holy Cross Fathers' Office of Province Development. In earlier years he was vocation director for the Holy Cross Fathers and promotion and advertising director of *The Catholic Boy*. Father Wilson was graduated as a layman from Notre Dame in 1932 and received a law degree from the Chicago-Kent College of Law in 1934. He entered the Congregation



Father Cavanaugh



Father Wilson

of Holy Cross that year and was ordained to the priesthood in 1941.



Father O'Donnell

Father O'Donnell, also born in Chicago, was graduated from Notre Dame in 1941 and was awarded a master's degree by the Catholic University of America, Washington, D.C. He was named assistant to the director of the Notre Dame Foundation in 1953 and subsequently became associate director of the organization. Father O'Donnell entered the Holy Cross Fathers' novitiate in 1936 and was ordained to the priesthood in 1945. He is a former faculty member at Holy Cross College, Washington, D.C., and also served as associate editor of *The Catholic Boy*.

Cover Design:

Listed on the front cover are names of priests and laymen, all deceased, who have been associated in one way or another with the greatness of Notre Dame. REV. EDWARD F. SORIN, C.S.C., with seven Brothers of Holy Cross, founded the University in 1842 and was its first president; REV. JOHN A. ZAHM, C.S.C., teacher of distinction, had a far-reaching influence on furthering scientific investigation and research at Notre Dame in the 1870's; REV. JOHN W. CAVANAUGH, C.S.C., ninth president of the University in 1905-1919, was an exceptionally talented writer and speaker; REV. JAMES A. BURNS, C.S.C., Chemistry professor, tenth president (1919-1922), provincial; REV. CHARLES O'DONNELL, C.S.C., twelfth president (1928-1934), poet and inspiring professor of rhetoric; REV. ALEXANDER KIRSCH, C.S.C., priest-scientist and member of the Notre Dame faculty following ordination in 1880; REV. JULIUS A. NIEUWLAND, C.S.C., famed as the discoverer of neoprene, the first commercially successful synthetic rubber in America, died in 1936; REV. FRANCIS WENNINGER, dean of the College of Science (1926-1940) and organizer of the Notre Dame Academy of Science; JAMES F. EDWARDS, professor of History and head of the University Library (1874-1924); MAURICE FRANCIS EGAN, professor, poet, novelist and editor (1889); COL. WILLIAM HOYNES, dean and professor of Law at Notre Dame for half a century (beginning in 1883); ALBERT F. ZAHM, founder of modern aeronautical science (1880), professor, chief of the aeronautical division of the Library of Congress (brother of Father John A. Zahm); JEROME J. GREEN, the first American to send a wireless message (1899) and professor of electrical engineering at Notre Dame; KNUTE K. ROCKNE, Chemistry teacher and builder of men (died in 1931); WALDEMAR GURIAN, internationally-famed political scientist, editor, professor (at Notre Dame, 1937-1954); BERNARD C. BARTH, first general manager and vice-president of Notre Dame's commercial television station (1955-1959).

Notre Dame, man and his world...



Rev. James A. Burns, C.S.C.



Albert F. Zahm



Rev. Julius A. Nieuwland,
C.S.C.

Bold vision and solid Christian fortitude inspired Father Edward F. Sorin to found Notre Dame in the Indiana wilderness in 1842. Indeed his vision and fortitude became indelible marks forever stamped on the character of this University.

Down through the succeeding 117 years, the members of his Notre Dame family — priest, brother, and layman alike — have faced their many challenges with the same characteristic virtues. One of these challenges, only dimly discernible in Father Sorin's day, has now emerged almost explosively to create a host both of opportunities and of problems. Carrying on in Father Sorin's tradition, Notre Dame has no choice but to grasp these opportunities while grappling with the problems they create.

More specifically, the opportunities are for the faculty to augment their professional stature as scholars by pushing forward the boundaries of knowledge, by synthesizing the old and discovering the new, through individual and collaborative research. The problems are mainly for the University to provide the means and incentives for research while striking that delicate balance between its traditional functions of preserving and disseminating knowledge as well as of discovering it. And all of this must be done within that precious framework of academic freedom that is the hallmark of any university worthy of the name.

Because it has been so regularly used in a narrow sense to describe the highly specialized methods of modern science, "research" has taken on an unnecessarily restrictive meaning in the popular mind. Within the University, research is best defined as those freely chosen activities of the professor not directly involved in his teaching function and which have the effect of broadening his personal grasp of an intellectually respectable body of knowledge. This definition encompasses a whole host of intellectual activities. All book reading, except that done for entertainment or diversion, is research. Meditation is research of a very powerful sort. Out of it comes new insights into the essential relationships between God and man, between man and his fellow man, between man and the created universe. Much of the theoretical framework of such disciplines as psychology and sociology grow out of informalized and unsystematized introspective interludes. In

RESEARCH

and Notre Commitment

Ed. Note: This is a special issue of NOTRE DAME highlighting research activities on campus in science, engineering, arts and letters,

law and commerce. Material has been submitted and written by Francis X. Bradley, Jr., assistant dean for research in the Graduate School since 1957, and members of the Notre Dame faculty. Mr. Bradley is also Acting Administrative Director of the University's Loebund Institute.



Francis X. Bradley

Mr. Bradley considers his proper function to help the University create the environment, opportunities and incentives for faculty research and scholarship. He tries to keep the faculty informed of the many developing interests of government agencies, foundations and private organizations in sponsoring research and faculty scholarship. He also serves the sponsors, the faculty and the University administration by coordinating the many details involved in administering sponsored activities.

Mr. Bradley was awarded a bachelor of science degree in aeronautical engineering at Notre Dame in 1939. After serving as a lieutenant colonel in the U. S. Army Air Corps during World War II he returned to the campus to receive a master's degree in mathematics and a Juris Doctor degree from the Notre Dame Law School in 1949. A year later Mr. Bradley was awarded a master of laws degree by the Yale Law School.—J.N.C.

fact, the exciting story of modern scientific discovery is replete with examples of basic theory discovered through sudden flashes of intuition.

But research in the twentieth century means much more than book browsing and meditation. With the means of communication so marvelously at hand, Christian charity dictates that they be used for the

Dame's to Excellence

By Francis X. Bradley

widest possible dissemination of knowledge and truth in furthering the welfare and happiness of mankind. Christ's injunction to go forth and teach all nations was His directive to insure the benefits of Divine Revelation and the Mystery of the Redemption to all men. The fact that God's continuing revelation of Himself and His Creation proceeds laboriously in time through man's successive discoveries only lends weight to this injunction. Thus the mark of a Christian scholar has become his willingness to share and to expose for critical evaluation the results of his scholarship.

Research in the twentieth century is aided by powerful tools. The refined applications of mathematics and logic to scientific investigation, the power of empirical methods in the study of nature, the systematic organization of specialized bodies of knowledge — these have radically accelerated the pace of discovery in the natural sciences and, to a lesser extent, in the social sciences. The faculties and facilities involved in this research pose formidable problems for the University.

The systematic organization of specialized bodies of knowledge presents major responsibility not only for the student faced with the task of mastering one of these specialties but also for the University and the faculty in providing him the opportunity to do so. The University in its necessary magisterial role must guide the student away from narrow specialization without compromising his professional preparation and must insist on breadth of vision with-

out encouraging diffusion of effort and interest. In fact, with the advent of specialization, this has become the classical educational problem in the modern university.

The application of empirical methods, particularly in the natural sciences where there value has been amply demonstrated, places great demands on the University's resources to provide the essential equipment. Wind tunnels, shock tubes, particle accelerators, biotrons, mass spectrometers, radiation sources — these are things modern research are made of. Some of them transcend the resources of a private University and have to be provided by public funds for research in the national interest. Others are within the financial reach of the University but only at the expense of its other ambitions and responsibilities. The demands grow daily for more sophisticated and expensive equipment. Certainly but for the federal support provided through sponsored research much of this equipment would not be here and, as certainly, without it many of our best faculty members would not be here either.

Even the applications of mathematics and logic to research problems can no longer be sketched out on the back of an old envelope. More likely they will have to be programmed on an IBM 704 computer — an intricate, electronic marvel with an unsatiable capacity for solving problems and for using good men and much money in the process.

The real scientific and technological problems of man in space are only now being discovered with all their staggering implications. Beset by threats ranging from lethal radiation belts to psychological trauma, man's life in space may indeed be an unhappy one for a long time to come.

Despite these demons charted in space, Notre Dame has, nevertheless, a firm commitment to engage as a cooperative partner in the Christian intellectual tradition that has brought man to this new threshold. Our capability to engage is enhanced by our identification with the centuries old dedication of the Catholic Church to the optimistic notion that man, with God's grace, is intellectually and morally perfectible. The pages that follow are intended to give you an impression of Notre Dame's commitment to this evolving intellectual tradition of research as one ingredient in her drive toward excellence.



Rev. John A. Zahm, C.S.C.



Waldemar Gurian



Rev. Francis Wenninger,
C.S.C.

Research and Scholarship at Notre Dame--1959

Within the short compass of the following ten pages it is not possible to describe even briefly all of the sponsored and unsponsored research and scholarship now in progress at Notre Dame. Also many valuable educational and spiritual programs, not strictly classifiable as research, are features of the intellectual life of the campus. Characteristic of these are the Institute of Spirituality, Father Mathis' Liturgy Program, National Science Foundation sponsored teacher training institutes and many distinguished symposia and lecture series. These are the proper subject of a separate survey to be published in a later issue of Notre Dame.

Probing the Human Spirit

Some Theologians

Their Current Interests

Rev. Robert S. Pelton, C.S.C.

A continuing preoccupation of a theology faculty is the role of theology in the intellectual life of the University and in forming the spiritual life of the layman. As part of this study, five professors in the Theology Department are carefully designing a new approach to graduate training.

Rev. Philip L. Hanley, O.P.

This desire to stimulate students of theology leads to an attempt to integrate the thought of St. Thomas Aquinas with modern Encyclicals, on the one hand, and the Fathers of the Church, on the other, into a text for study groups at the collegiate and alumni level.

Rev. John S. Dunne, C.S.C.

Two approaches go hand in hand: one modern, attempts to mark out the common grounds of Catholic and Protestant theologies as a first step on the long, difficult road to Church unity; one ancient, studies the religious ideology of the Hellenic city-state.

Rev. Edward D. O'Connor, C.S.C.

Among several challenging subjects in view are the problems of Catholicism and academic freedom, the historical evolution of the theology of Faith and early scholastic Mariology.

Rev. Charles H. Henkey

Aesthetics and the metaphysics of love are taken as a philosophical basis for the better understanding of this sacramentality. The Incarnation, source of the Church's sacramental character, is studied as the unifying element of Catholic theology.

Rev. Roman S. Ladewski, C.S.C.

What psychology and pastoral theology have to say

about the role of parents in the moral guidance of their children.

Rev. William J. Hegge, O.S.C.

G. K. Chesterton, his apologetic method and the leading idea in all his writings command attention as illuminating the broader problem of the apologetics appropriate to the "newer theology."

Some Philosophers

Their Present Intellectual Exercises

Rev. Herman Reith, C.S.C.

The intellectual life and the teaching profession is one pole and the philosophy of Communism as developed in the writings of Lenin is the other.

John James Fitzgerald

The formulation and evaluation of the substance of Jacques Maritain's theory of knowledge as revealed in his works now treasured in Notre Dame's Maritain Center.

Joseph Evans

A critical edition of the philosophy of Maritain is a primary goal for the director of the Maritain Center.

John A. Oesterle

Studies the texts of Albertus Magnus in formal logic to evaluate their significance for logic in both medieval and modern thought.

Boleslaw Sobocinski

Launches the new "Notre Dame Journal of Formal Logic" as a labor of his love for symbolic logic and the foundations of mathematics.

Herbert Johnston

The philosophical implications of such diverse developments as subliminal advertising and strikes not involving work stoppages attract the Thomist interested in business ethics.



Those attending the opening of the Maritain Center at Notre Dame included, (left to right): Victor Schaefer, Director of the University Library; Joseph Evans, Director of the Center; Professor Jacques Maritain, world-renowned philosopher; and Father Herman Reith, C.S.C. and Frank Keegan, both of the N.D. faculty.

Rev. Ernan McMullin

The philosopher of science trying to reconcile philosophically the multiple formulations of the physicist's uncertainty principle and to shed some light on the famous Galileo attempt to prove the motion of the earth with all its repercussions.

Joseph Bobik

The challenging intellectual exercise is to identify the sets of objects suitable to metaphysical inquiry as a refinement of the methods of metaphysics.

Journet Kahn

Attempts to contrast the basic assumptions of existential analysis with those of Sigmund Freud and to evaluate the assumptions attributable to each school of thought philosophically.

Otto Bird

From the viewpoint of modern logic analyzes the history of medieval logic to show what the great medieval logicians were up to in their treatises on the subject, to trace the development of the tradition they established and to show its relevance to contemporary accounts of the laws of nature and of argument.

Frank Keegan

Looks into the earliest political ideas of Maritain during his "Action Francaise" days and into his commitment to the conservative, monarchical tradition in French politics.

Some Historians

Their Resurrections

Rev. Astrik L. Gabriel

Medieval education as exemplified by the University of Paris and as reflected in the lives of great medieval educators occupies the center of interest as a part of the program of the Medieval Institute.

Rt. Rev. Philip Hughes

Profound and prolific scholarship ranging over "The General Councils of the Church," "The Returns of the Catholic Church to the English State 1829-51," "Lingard, Pioneer of Scientific Historical Writing," "The Catholic Reformation" and others.

Marshall Smelser

American historian recording especially the era 1801-1817 for a multi-volume history of the United States.

William O. Shanahan

Researches the German Protestant effort to come to terms with the social changes caused by the industrial revolution during the latter part of the nineteenth century for a book to be published under the auspices of Notre Dame's Committee on International Relations.

Boleslaw Szczesniak

Organizing a volume, or two, of information about Soviet Russian Central Asia with special interest in the formation of the new nationalism and in tendencies toward self-determination among the Asiatic republics dominated by the Russians.

James A. Corbett

Delves into medieval commentaries on the Bible.

Walter D. Gray

The political beliefs and activities of the "notables" in France from the Revolution of 1848 to the 16th of May, 1877.

Rev. Paul E. Beichner, C.S.C.

A medieval classicist reports on Chaucer "Baiting the Summoner" and translates the *Aurora* of Peter Riga, a unique 12th-century versification of the Bible.

LIFTING THE HUMAN SPIRIT

Some Artists

Some of Their Inspirations

Rev. Anthony Lauck, C.S.C.

Based on a concerted study of "sleep" as expressed in concentric and parallel diagonal lines he attempts to capture this fascinating concept within the horizontal forms of carved wood.

Ivan Mestrovic

Massive stone and textured wood chiseled into powerful expressions of the human condition, monuments to the eternal love of God for man.

Stanley S. Sessler

Portraiture in the classical tradition personalized with modern symbolism and figure drawing as a basic discipline command his talents.

Frederick S. Beckman

Investigates crafts and product design in Northern Europe as well as the renaissance of crafts in the United States for their total impact on an industrial culture.

C. A. Biondo

Translator of the one and only authoritative book on the stylistic history of violin performance by the German scholar, Andreas Moser.

VIVIFYING THE HUMAN SPIRIT

Some Educators

Their Pedagogical Predilections

Willis D. Nutting

Here is concern for the impediments placed by the contemporary university system and its scholarly ideals in the way of educating men to be wise.

Rev. John E. Walsh, C.S.C.

Preliminary to revision of Notre Dame's approach to teacher education is a study of selected programs in other universities.

Bernard J. Kohlbrenner

Specializes in the role of Catholic education in America and a historical review of its contribution to national life and culture.

Anthony C. Riccio

A counselor educator self-impelled to examine the theoretical foundations of the student guidance movement and to measure the attitude of college students toward their image of themselves.

Jerome J. Fargen

Discovers the potentially academically outstanding ten per cent of each enrolling class at Notre Dame to determine the probable causes of the usual lower-than-expected academic performance of about one-third of this group.

Some Literati

Their Love Affairs with the Written Word

Francis E. Moran

Milton and the 17th-century world of English literature is set aside for the moment to work out a critical essay on Dicken's novel, *Great Expectations*.

Louis Hasley

Has a conception of *beliefs in literature* based on the techniques by which an author reveals his own beliefs in imaginative literature.



Professor Ivan Mestrovic, member of the Notre Dame faculty and recognized as the greatest living sculptor on religious art.

Jerome Taylor

Completed is a book: *Hugh of St. Victor's Didascalicon, or Study of Reading*; projected is a study of the versions or images in contemporary Christian criticism of literature.

Paul E. McLane

Dwells on the religious, political and personal allegory and satire in Spenser's poetry and dramatic "toni" in Shakespearian drama.

Robert M. Browne

Degree of applicability of modern structural linguistics and traditional rhetorical analysis to the criticism of poetry.

Alvan S. Ryan

The great Victorian prose writers expound views of the past and use these interpretations as vehicles of their thought. To explore this facet of Victorian literature, a book-length study of the differing images of the past found in Carlyle, Newman, Ruskin, Arnold, Mill and Pater is attempted.

Ernest E. Sandeen

Poet and literary critic in American literature with a study of Henry James, Walt Whitman and other 19th- and 20th-century American writers well advanced.

Mortimer J. Donovan

Literary historian carried back to a medieval literary genre found in France and England between 1170 and 1400 and to manuscripts of a Roman poem read by poets in the medieval schools.

Some Linguists

Some Language Lore

William H. Bennett

Germanic linguist probing and translating classics in the Gothic language.

John Fizer

Focuses on Russian materials to reveal Communist Party regimentation in fields of literature, literary scholarship and esthetics.

Henry Hare Carter

Fifth in a series of medieval texts now in preparation is a paleographical edition of a medieval, unedited Portuguese Grail manuscript.



Dr. Stephen Kertesz, former Hungarian minister, has been Chairman of the University's Committee on International Relations since 1955.

Some Communicators

Their Media

Edward A. Fischer

Journalist and critic influencing contemporary mores by presenting in book and journal practical standards for motion picture and television criticism.

Thomas J. Stritch

Mass communication researcher interested in film history and criticism; in art and its role in journalism.

Rev. A. S. Harvey, C.S.C.

The living stage is his medium for expressing the tragedy and joy of the human condition.

ORGANIZING AND MOLLIFYING THE HUMAN SPIRIT

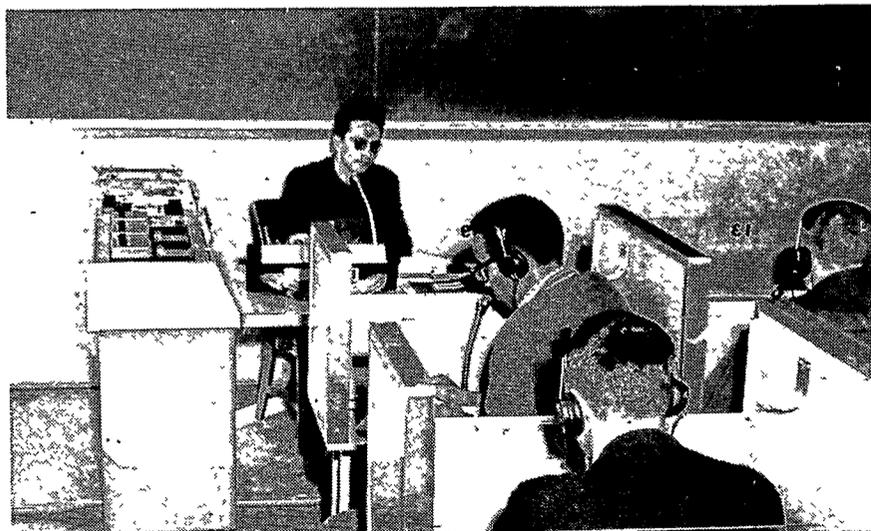
Some Sociologists

Their Views of Our World

John J. Kane

The comparative impact of college education on the

The Modern Languages laboratory at Notre Dame.



values cherished by students in secular and religious schools is beyond the pilot study stage.

Julian Samora

The socio-cultural aspects of medicine particularly as they apply to the underprivileged Spanish-Americans of the southwest lead to many thoughtful journal articles.

William Vincent D'Antonio

Study of "influentials," the sources and solutions of issues and social mobility especially in communities and health systems with Spanish-speaking leaders.

Donald N. Barrett

Empirical methods are used to assemble data, in one study, on the effects of financial penalties for crime and, in another, on the structure of the Catholic population of the United States.

Some Political Scientists

Their Critiques

Stephen Kertesz

Energetic and inspired leader of the Committee on International Relations with its research on the diplomacy relevant to the current East-West conflict.

John J. Kennedy

Scholarly commentator on the Latin American political scene with special interest in charting the progress of freedom and democracy in these troubled nations.

Gerhart Niemeyer

Taken up with the *total critique of society*, the study of the intellectual and spiritual forces behind the

total rejection of today's society by communists, anarchists and other contemporary revolutionists.

Paul C. Bartholomew

Eloquent exponent in books and articles of American constitutional government, the Anglo-Saxon common law and the political values of democratic society.

Some Economists

Their Views of the Market Place

Rev. Mark J. Fitzgerald, C.S.C.

Absorbed in the study of industrial relations in the European coal and steel community; also in the interpretation of Mr. Justice Reed's decisions involving the American economy.

John T. Croteau

Varied topics include tax problems of mutual financial institutions; credit union growth, liquidity, earnings and other operational problems.

John H. Sheehan

Everyman's economist devoted to the study of family economics and personal finance—for publication in a form usable by the average consumer.

Paul A. Montavon

Concerned about income distribution, he searches for an integrated approach to the problem consistent with the price theory on the one hand, and with the theory of aggregate shares on the other.

Warren J. Bilkey

Making five waves of cross-sectional interviews of 60 South Bend families to ascertain their psychological reaction to consumer goods purchases to gain an insight into the effect of purchases, income, and prices on their consumption behavior.

Some Entrepreneurial Pedagogues

Their Research in Business and Management

Raymond P. Kent

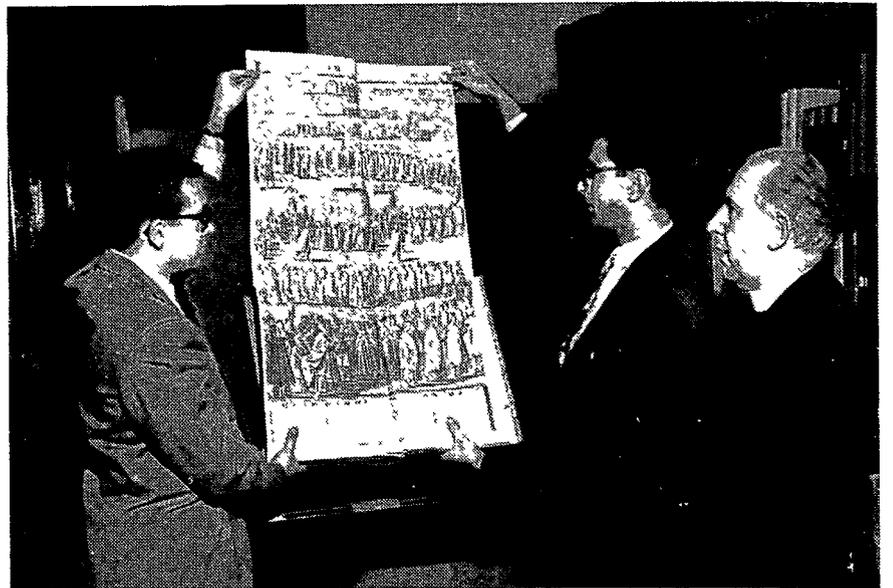
Sometime author of *Money and Banking* text about finished with another on *Corporate Financial Management*.

Herbert E. Sim

Exploring empirical economic research to illuminate such problems as local mass transportation, local business indicators and impact of local government structure on business.

Ching-wen Kwang

In the modern spirit of interdisciplinary research is the study of the application of mathematical programming to the theory of the firm.



The Mediaeval Institute is one of the world's most promising projects for higher study and research. Rev. Astrik Gabriel (right) serves as director.

Vincent R. Raymond

Proposes a depth study of the management training needs of small business managers with an accompanying conceptual scheme dealing with small business managerial development.

Salvatore J. Bella

The pattern of union-management relations in a decentralized multiplant company is the subject of a study now in the writing stage.

Richard M. Lyon

Lawyer searching for effective ways to instruct commerce students in the intricacies of administrative law and the legal aspects of business. Also pushing for judicial reform in Indiana through abolition of the *Justice of the Peace* courts and of politically appointed judges.

Some Lawyers

Their Scholarly Lives "Under God and the Law"

Anton-Hermann Chroust

Early American legal profession comes to life in a series of studies. Also original thoughts about the philosophy of Plato in books and articles reflect his basic philosophical bent.

W. D. Rollison

Progenitor of a unique and valuable synthesis in text form of the law of estate planning cutting across the traditional fields of wills, trusts and future interests.

Roger P. Peters

Specialist in taxation and constitutional law vigilantly reviewing developments in these subjects with frequent commentaries in the professional journals.

John J. Broderick

Law of evidence with its myriad technicalities especially as related to the use of expert medical witnesses and psychiatric testimony is his forte.

Harris L. Wofford, Jr.

Visiting professor appraising the work of the Civil Rights Commission based on his experiences as a legal assistant to Father Hesburgh during his term as a Commissioner.

Thomas F. Broden, Jr.

Co-author of a treatise on social security law entailing a detailed examination of all applicable federal and state laws.

Edward J. Murphy

Panoramic view of the field of contracts is assayed to discover modern trends and a history of the doctrine of estoppel is in progress from which may be divined some reasons for the amazing vitality of the *Common law*.

Conrad Kellenberg

Deeply involved with a treatise on real property law begun during last year's tenure as a Sterling Fellow at Yale Law School.

Bernard J. Ward

Dedicated to elucidation of the role of the United States Supreme Court in the American constitutional system.

PIONEERS ON THE NEW FRONTIERS OF SCIENCE

Some Life Scientists

Their Biological Expeditions

Ralph E. Thorson

Engages in a comparative study of the enzyme systems and other substances of physiological activity in various nematodes to determine the role of these substances in creating protective immunity in the host.

Rev. C. S. Bachofer, C.S.C.

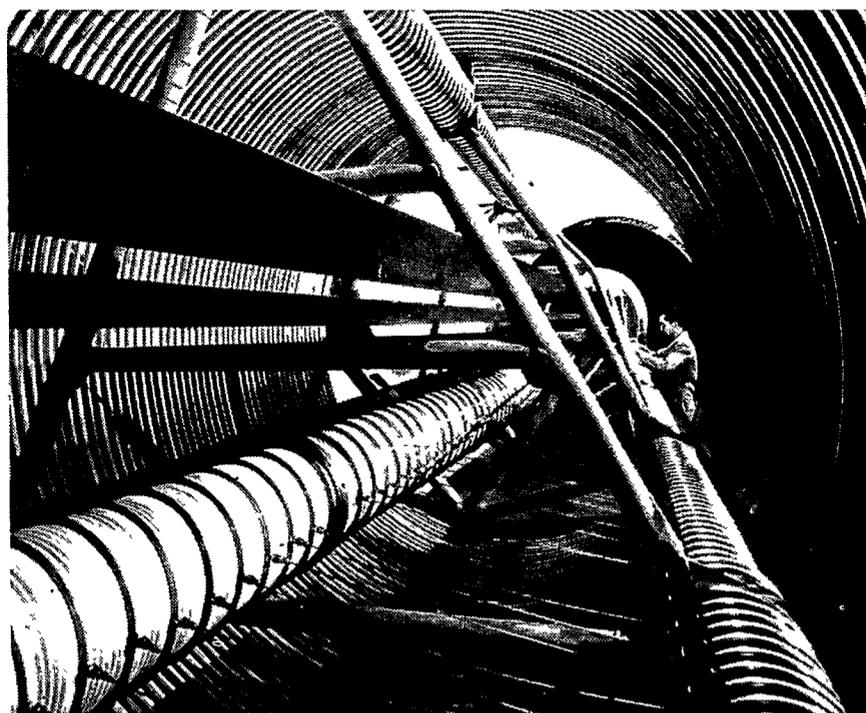
Studies the reactions of nerve trunks of selected animals and plants to X-rays, beta rays and ultraviolet radiation with measurement of action potentials, impulse propagation rates, sensitivity and refractoriness to radiation stimulus.

Thomas G. Ward

Energetic pursuit of a vaccine against mild respiratory disease along with germfree animal studies on viral status, aging, incidence of cancer and effects of burns.

P. C. Trexler

Ingenious inventor and developer of contamination control apparatus and methods to provide sterile environments for animals and for testing and manufacturing pharmaceuticals. Also a student of the relationship between animals and their associated microbic flora.



Above is one of the University's electro-static generators used for experimentation in atomic research.

B. S. Wostmann

Biochemist and nutritionist deeply engrossed with the influence of a normal or pathological flora on the host animal with emphasis on the biochemical mechanisms underlying body defenses and on the role of the flora in nutrition.

Helmut A. Gordon

Finds challenge in the study of the morphology and physiology of Notre Dame's unique germfree animals with emphasis on the role of the bacterial flora in the host-contaminant relationship.

Morris Wagner

Collaborator in the host contaminant studies of germfree animals with a special interest in identifying the microorganisms specifically responsible for dental caries and periodontal disease.

Gerd T. A. Benda

Hirsute micro-manipulator of plant cells determined to find out if and how they heal their own wounds.

Rev. James Doll, C.S.C.

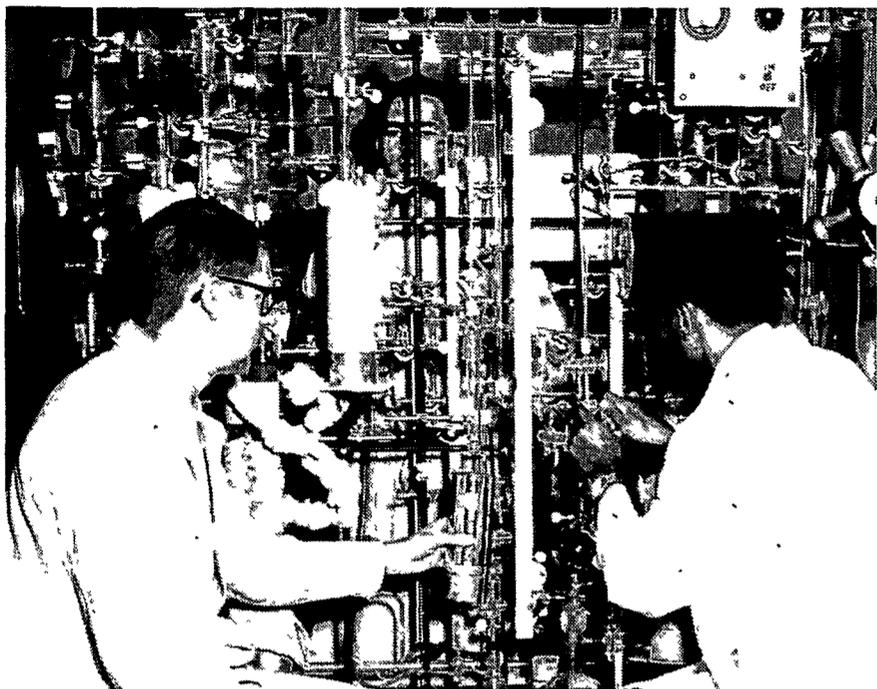
Now applying radioisotope techniques to study the mechanism by which animals are able to clear labeled organic and inorganic invaders from the blood stream.

Kenyon S. Tweedell

A major effort centers on the study of a transmissible kidney tumor of the frog using ultraviolet radiation and radioisotope techniques.

George B. Craig, Jr.

A medical entomologist with a comprehensive study of the genetics of *Aedes Aegypti*, a species of mosquito, in progress.



The Department of Chemistry and the Radiation offer excellent facilities for research.

Robert E. Gordon

Editor of Notre Dame's *American Midland Naturalist* who finds time to study locomotive activity in selected animals as a guide to possible existence of rhythmic cycles related to species survival.

Robert P. McIntosh

Finds intriguing the structure and organization of plant communities with a specific field project in the Catskill Mountain region.

George R. Bernard

Products of metabolism excreted in the urine of infected hamsters and turkeys and the function of the rectal gland are two subjects currently being pursued.

Some Physical Scientists

Their Forays Among Molecules, Atoms, Nuclei, Particles

E. A. Coomes

Solid state physicist elaborating the mechanics of crystal growth, surface emission characteristics of crystals, matrix mechanics of electrical transport in polyphase systems and other related phenomena.

C. J. Mullin

Describes his work, generally, as the study of interactions of photons and particles with nuclei, and, specifically, as the study of radiation from high-energy electrons, their scattering and the properties of light nuclei.

Bernard Waldman

Using Notre Dame's medium energy accelerator, nuclear excitation by radiation is studied while design work on the high energy colliding beam accelerator for Midwestern University Research Associates continues.

John W. Mihelich

His nuclear spectroscopy of rare earth nuclides aims to fill in the gaps of knowledge about their properties at high energy levels.

D. W. Juenker

Examines the fundamental processes involved in the external photoelectric effect in metals and semiconductors.

R. L. Anthony and Alex. A. Petrauskas

Information about the internal motion and structure of molecules is being derived from studies of ultrasonic attenuation in low molecular weight liquids.

Emerson G. Funk, Jr.

Decay schemes of radioactive nuclei are explored to determine the ordering of the energy levels and the characteristics of these levels.

G. F. D'Alelio

An organic and polymer chemist with a wide range of interest in new organic compounds including heat resistant and high energy polymers and in the effects of radiation on polymers especially those, such as proteins, associated with living organisms.

Milton Burton

A physical chemist directing and conducting manifold research projects probing the elementary processes involved in radiation chemistry.

Charles E. Brambel

A biochemist deeply engrossed with blood clotting, the development of chemical agents to control blood hemorrhage, effects of vitamin K deficiency on the hemostatic mechanism, and effects of continuous low level radiation on mammals.

Bro. Columba Curran, C.S.C.

A series of studies including infrared and ultraviolet absorption measurements of reactions between coordination compounds of metal halides and halide ions in the solid state; dielectric and spectroscopic studies of hydrogen bonding in various organic compounds containing N-H and O-H bonds.

San-ichiro Mizushima

Visitor from Japan concentrating on structure of molecules by investigation of infrared, Raman and ultraviolet spectra.

George F. Hennion

Carrying on a Notre Dame tradition in acetylene chemistry started by Father Nieuwland to synthesize new compounds of potential interest in the drug field.

John L. Magee

Backs up radiation experiments with appropriate theoretical studies now heavily concentrated on radiation initiated reactions in the gas phase.

William H. Hamill

Physical chemist with several current interests such as: mass spectrometric observations of ion-molecule interactions; radiation chemistry of organic liquids; diffusion kinetics in liquids at high pressures.

Patrick A. McCusker

Observation of new reactions and syntheses of new compounds are sought in studies of the disproportionation and other reactions of organoboron and organosilicon compounds.

Ernest L. Eliel

An organic chemist does conformational analysis of simple cyclohexane derivatives to determine the relationship of their properties and reactivity to their geometric shape. Also studies the mechanism of free-radical aromatic substitution.

Rudolph S. Bottei

Thermal and structural properties of inorganic polymers and of organometallic compounds and organic functional group analysis are his research preoccupations.

Emil T. Hofman

Director of chemistry teacher training summer institute also studies the preparation and properties of chelating resins.

Vincent J. Traynelis

Finds himself attempting the synthesis of novel heterocyclic systems and also the study of certain reaction mechanisms such as are involved in the reaction of 2- and 4- picoline N-oxide with acetic anhydride.

Richard C. Pilger, Jr.

Investigates nuclear decay schemes of various members of the actinium natural decay series — nuclides noted for their complexity.

Rev. Thomas J. Lane, C.S.C.

Engages in chelate formation studies of a group of heterocyclic compounds of interest in biology and medicine. Also studies aminoacid and protein metal complexes.

James P. Danehy

An organic chemist launching studies of the reactions of alkyl phosphites with organic disulfides.



Isidore Hodes, (above), is a physical scientist in the College of Engineering. His field is "bridging the gap between electromagnetic theory and its engineering applications."

William M. Fairley

Sequence of formation, structures and metamorphic zones in pre-Cambrian rock units are determined by field mapping, and petrographic studies.

Rev. Michael J. Murphy, C.S.C.

Resorts to specific gravity, optical tests and X-ray methods to study substitutions in the mineral series "wulferite-stolzite" and "geocronite."

Some Mathematicians

Their Sophisticated Precisions

Arnold E. Ross

Busy director of many special educational programs with time for study of the minima of the indefinite ternary quadratic forms with real coefficients.

Vladimir Seidel

Of current interest are the conditions under which meromorphic functions in the unit circle approach a definite limit as the argument approaches a point of the circumference continuously.

Ky Fan

Topologist and functional analyst working with convex sets in topological vector spaces; absolute retracts and absolute neighborhood retracts; extension of mappings and of homotopies.

Hans Julius Zassenhaus

Prolific scholar with current books and papers on semi-class groups in algebraic number fields, application of Lie-algebra in finite group theory, representation theory, and linear algebra and projective geometry.

Richard Otter

Now looks at probability theory, especially its asymptotic laws; and function theory, especially unbounded functions on the unit circle.

Some Earth Scientists

Their Intriguing Proclivities

Raymond C. Gutschick

Concentrates on Early Mississippian paleontology and micro-paleontology in Indiana, Arizona, Montana, and other places to gain an understanding of the stratigraphy, environments, evolution, correlation and other geologically interesting characteristics.

Erhard M. Winkler

Teams with his wife, a commercial pilot, to take color air photos for interpretation of glacial drifts.

Some Engineers

Their Creative Applications of Science

F. N. M. Brown

Tamer of turbulence in a unique smoke tunnel yielding sharp pictures of airflow, the means by which the mechanism of transition from laminar to turbulent flow within the zero gradient boundary layer might be discovered.

Allen S. Smith

Expert in the application to pollution problems of the measurement of adsorption and vapor-liquid equilibrium of ternary systems, the correlation and evaluation of their thermodynamic properties. A more specific interest is pickle liquor disposal and acid recovery in the manufacture of steel.

Ernest J. Wilhelm

Investigates possible development of an electrochemical method for evaluating the control of galvanic corrosion by corrosion inhibitors.

James P. Kohn

Searches for a simplified model of the liquid state using phase and volumetric approaches particularly near the critical points where liquid and vapor are identical. Also by diffusion studies of spherical tops (methane molecules) he studies the mean free path in the liquid state.

Steponas Kolupaila

Caps his professional career with compilation of a bibliography on hydrometry from a unique file of book and journal article references accumulated here and abroad over the past forty years.

Leroy D. Graves

His research attempts to establish a mathematical relation between the physical properties of soil and the movement of footings and piles under load.

Prof. Newman (left) and observer inspect sub-critical nuclear reactor in Nuclear Engineering Department.



Commerce students using modern desk computers, increasingly important tools in business and management.

Harold E. Ellithorn

Electrical engineer wrapped up in the analysis of nonlinear electrical elements and circuits and energy considerations for electrical relays.

Arthur J. Quigley

Collaborator in the physical electronics laboratory of the Physics Department specializing in the study of surface phenomena of solids such as tungsten.

Isidore Hodes

A physical scientist and engineer bridging the gap between electromagnetic theory and its engineering applications particularly in advanced microwave detection apparatus.

Clyde Hoffman

Analog and digital computer specialist with an interest in both theory and development as typified by the creation of stability diagrams for nonlinear systems.

O. G. Strandhagen

Engineering scientist generating new knowledge about the hydrodynamics of shaped bodies on or beneath the surface of heavy fluids through measurement of hydrodynamic forces and moments and through formulation of new concepts of cavitation and ventilation.

M. O. Peach

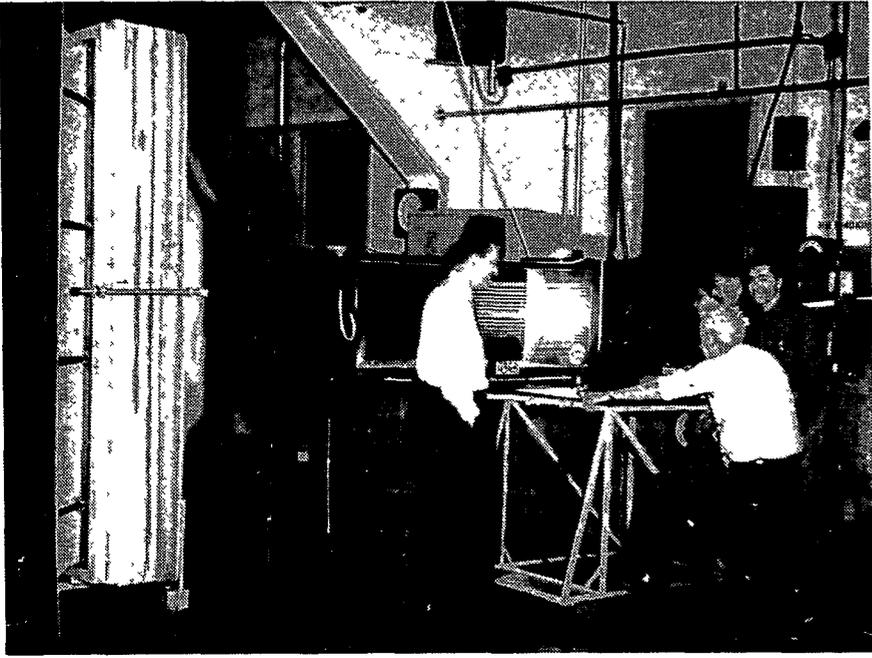
Takes the engineering science approach to such studies as structural dislocations in aluminum and the separation of elastic and plastic states in solids.

Lawrence H. N. Lee

The cylindrical, thin-walled shell—the classical structure of the missile age—is subjected to theoretical and experimental study under combined axial compression and lateral pressure in the inelastic range.

Yan-Po Chang

Pioneering a new approach to the mechanism and theory of turbulent flow with further specific interest in the heat transfer and critical conditions in nucleate and in film boiling of importance in nuclear reactor design and operation.



Prof. Frank N. M. Brown (seated) and group observe the photographing of airflow in a smoke tunnel.

Marcel K. Newman

Leader of a nuclear engineering program in the Mechanical Engineering Department, he is also deeply involved in the studies of wave propagation and energy dissipation in solid materials.

C. Robert Egry

Industrial engineer using time and motion studies as the basis for improving the efficiency of industrial operations.

E. W. Jerger

A thermodynamicist with research interest and experience in the analysis and testing of temperature sensing devices based on considerations of energy conversion and the behavior of liquid, solid and gas systems in extreme temperature ranges.

Kwang-Tzu Yang

Another thermodynamicist primarily interested in heat transfer including study of unsteady laminar boundary layers in compressible flows; nonlinear heat conduction involving property-temperature variation and movable boundaries; heat transfer in duct flows with and without surface suction or injection; and unsteady free convection with arbitrary surface temperature variation.

Stanley S. Thomas

A design engineer, he has interests that include the experimental techniques involved in metal displacement and in failure producing phenomena; also gaseous diffusion through welded metals.

Francis H. Raven

Styles himself as a control engineer, kinematician and machine designer. His current research is on equilibrium and transient behavior of flow through series orifices. He also studies fundamental problems in kinematic synthesis as a basis for establishing design requirements of control systems including materials and performance requirements.

Michael A. DeCicco

Heat transfer specialist applying advanced experimental techniques and theory to evaluation of components of air conditioning and refrigeration systems.

Ettore A. Peretti

Head of the Department of Metallurgical Engineering, studies phase relationships in systems involving semiconductors to develop basic data for growing crystals from the melt and to develop new intermetallic types as semiconductors for thermoelectric applications.

George C. Kuczynski

A solid state physicist with a wide range of interests. He directs research that includes order-disorder phenomena in alloys, sintering of oxides of sulphides, photomechanical effects in semiconductors, effect of F-centers on mechanical properties of solids and sintering and crystallization of polymers.

Bernard D. Cullity

Physical metallurgist with research in progress to study the effect of preferred orientation on mechanical properties of metals, residual stress in metals by X-ray diffraction, effect of magnetic field on stress relaxation and effect of residual stress on magnetic hysteresis losses.

Charles W. Allen

Another physical metallurgist, collaborates closely with Professor Kuczynski on the interaction of color centers in alkali halides as a means of assessing the role of the surface of crystals in the plastic deformation process. Also he studies the effects of various kinds of radiation and of electric fields on the mechanical properties of semiconductors.

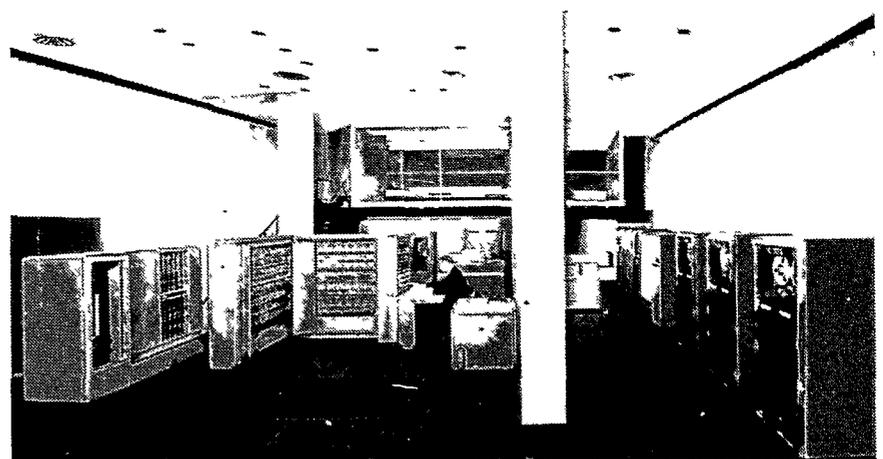
Paul Jacques Grillo

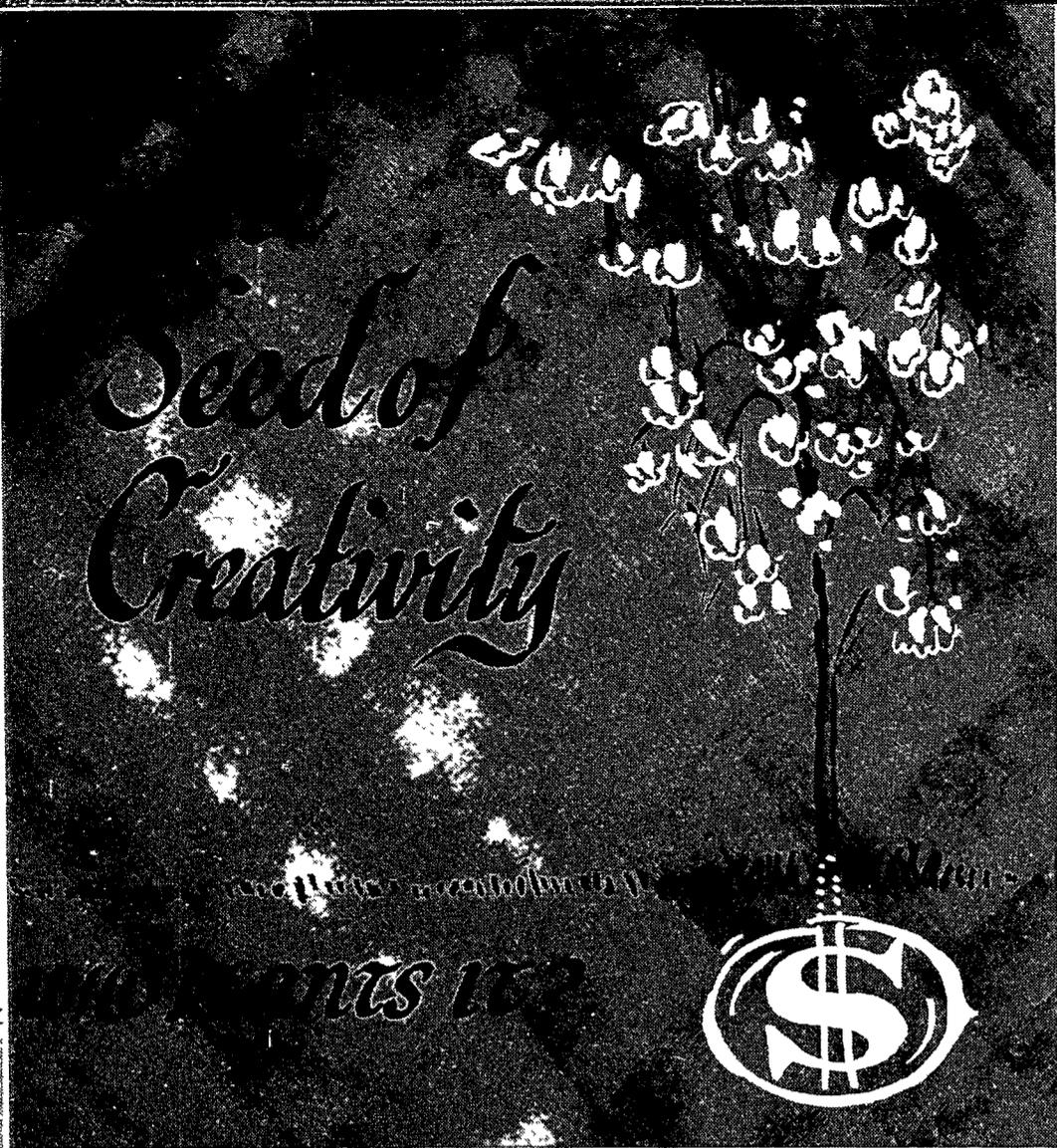
Architect, who colorfully calls himself a *human ecologist*, now finishing a book, *What Is Design?* and projecting a *Geophysical Survey of Culture*.

Ernest H. Brandl

With the aid and encouragement of the American hierarchy, lovingly resurrecting the 19th-century American cathedrals in all their architectural and historical significance for our Catholic cultural heritage.

IBM 704 digital computer installed elsewhere but typical of the expensive tools of modern research needed here.





Preoccupation with money may indeed be a sordid matter in some human affairs. But when money becomes the seed of creativity planted with care and affection by expert gardeners in the fertile imaginations of a university faculty, then it promises a precious flowering of the scholarly life with rewards in beauty and knowledge for all mankind. Fortunately, Notre Dame is privileged to be one of the many gardens in which this seed is increasingly planted.

The expert gardeners are, of course, the private corporations, the philanthropic foundations and government agencies supporting research. The seed they have planted in selected years from 1949 to 1959 is weighed in the accompanying chart.

Corporations

Over the past eleven years, corporation support of research at Notre Dame has not broken far beyond the one-hundred-thousand-dollar-a-year mark. The reasons for this are many. They include corporation policies that restrict research support to projects with a high degree of early applicability to the corporation's products whereas the University tends to encourage basic research. They include also a reluctance on the part of faculty to become involved in projects the lives of which are often terminated by changes in corporate managements or by unpredictable, short term swings in corporate earnings. This reluctance is abetted by the increasing availability of funds from foundations and government agencies with reasonably assured longevity.

A break in the pattern of corporate support of research may have been presaged during the 1958 recession by the action of many companies in broadening the base of their research effort despite reduced earnings. Certainly these companies gave research a vote of confidence as the means of creating new products and new applications for future expansion. In this day and age it is a truism to say that research is the life blood of the technological industries. More and more they will appreciate

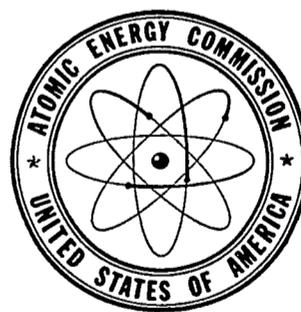
and support the basic work in problems of mutual interest by faculty members of universities including Notre Dame.

Foundations and Private Contributors to Research

Most philanthropic foundations have established a policy not to support research heavily funded by public agencies. They conceive their role primarily as one of stimulating scholarship in a way to preserve a balance between the natural sciences, the social sciences, the arts and the humanities. With heavy support of the natural sciences by the federal government, the foundations naturally concentrate their support on the social sciences, the arts and the humanities. Development of the kind of collaborative and interdisciplinary research most favored for support by the larger foundations is yet in an embryonic stage at Notre Dame. Typical are the Ford Foundation supported Committee on International Relations and the Rockefeller Foundation supported East European studies involving members of the political science, history and modern language departments. Notre Dame's future with the foundations rests squarely on the competence, imagination and desire of her faculty.

Federal Government

National defense, health, education and the general welfare are all compelling reasons for the federal government's ever-increasing dedication of tax money to the support of research. The accelerated pace of this federal support at Notre Dame is pointed up by the 1959 expenditures of \$1,395,900 of federally provided money compared to only \$265,100 in 1949. Also remarkable in the pattern of federal research support at Notre Dame is the progressive emergence of the Atomic Energy Commission, National Institutes of Health and National Science Foundation as heavy contributors. Whereas together these agencies accounted for only \$25,600 or 9.6% of the total in 1949 (NSF had not yet been established), in 1959 they had jumped to \$984,900 and 70% of the federal total.



Atomic Energy Commission

The Atomic Energy Commission supports research projects in Chemistry, Physics, Metallurgical Engineering, Engineering Science, Mechanical Engineering and Biology. It provides funds for the specialized and expensive equipment used in the Radiation Project, in radiation biology and in the nuclear engineering training program of the Department of Mechanical Engineering. Probably the largest organization of its kind on a University campus, the Radiation Project accounts for a major portion of the AEC funds in its research on the effects of radiation on matter. Recently the Commission has favorably received the University's proposal for construction on the campus of a two million dollar laboratory to house the Radiation Project. A decision awaits establishment of a national policy with respect to the use of federal funds for such a purpose.



National Institutes of Health

The National Institutes of Health in the U.S. Public Health Service is charged by Congress with the mission of engaging in research and training related to health and the medical arts. These Institutes administer an extensive research program. NIH sponsored research at Notre Dame includes work in Lobund (germfree life), Chemistry and Biology. In October of this year alone, proposals in excess of \$600,000 were submitted to NIH for a variety of research and training programs to extend over the next five years. There is no doubt that NIH will become an increasingly important source of research support for faculty with appropriate capabilities and interests.



National Science Foundation

NSF is the most recently created government agency charged with the mission of stimulating and supporting scientific research. It is set up in two divisions: one, to support research, and, the other, to support improvement and expansion of education in science.

On the research side, NSF receives project proposals from scientists and makes awards, for support up to five years, after review and approval by advisors and the National Science Board. This screening of proposals by advisors results currently in support of about 40% of the proposals received. At Notre Dame NSF supported research projects are active in the Chemistry, Mathematics, Biology, Lobund, Mechanical Engineering, Civil Engi-

neering and Metallurgical Engineering departments.

On the science education side, NSF supports a variety of teacher training institutes and special programs. At Notre Dame, NSF is supporting teacher training institutes in the Mathematics and Chemistry departments; also an undergraduate research participation program in geology, a research participation program for high school and college teachers in the Radiation Project and a gifted high school student program in Mathematics.

University participation in the NSF program seems to be keeping pace with the steady growth and increasing importance of that agency.



Office of Naval Research

The steady, high level support by the Office of Naval Research of Notre Dame's programs reflects a mutuality of interest that reaches back to the Navy research organizations of World War II that preceded ONR. Of course ONR is the archetype of the ideal basic research supporting agencies of the federal government. NIH and NSF were both patterned after ONR and, in the latter case, heavily staffed by ONR personnel.

ONR continues to support research projects in Physics, Metallurgical Engineering, Geology and Lobund. That the level of support has not increased radically over the past eleven years reflects more than anything else the fact that ONR's basic research funds have not increased significantly over this period.

Other Federal Agencies

Mention should be made of the Army Surgeon General's support of projects in Chemistry and Lobund; of Air Force support through Wright Air Development Center of radiation studies in the Radiation Project; of the Navy's Bureau of Ordnance support of work in Aeronautical Engineering.

RESEARCH EXPENDITURES — 1949-1959

SPONSORS	1949	1952	1955	1958	1959
Corporations	\$129,200	\$ 61,700	\$ 58,100	\$ 103,100	\$ 115,100
Foundations and Private Contributors to Research	6,400	84,000	113,800	116,400	115,400
Federal Government:					
Atomic Energy Commission	19,900	121,500	218,200	357,400	501,200
Bureau of Standards .....	....	22,000	....	....	....
Department of the Air Force .....	....	35,000	19,500	23,600	36,500
Department of the Army	1,800	34,000	128,300	39,500	78,900
Department of the Navy	205,400	281,900	258,200	249,500	295,600
Nat'l. Adv. Comm. for Aeronautics	32,300	5,000	....	....	....
National Institutes of Health	5,700	9,100	35,400	142,000	245,900
National Science Foundation .....	....	....	9,800	112,100	237,800
Total Government	265,100	508,500	669,400	924,100	1,395,900
TOTAL SPONSORED RESEARCH	\$400,700	\$654,200	\$841,300	\$1,143,600	\$1,626,400

NOTRE DAME'S DESIRE

NOTRE DAME'S DOLLARS

Some Hard Facts About Research . . .

The strength of Notre Dame's conviction that faculty research and scholarship are an essential part of her drive toward excellence is graphically portrayed in the picture presented here of the ever increasing expenditures for these purposes. The \$1,272,700 spent by the University in all the colleges in 1958 represents an amount equivalent to tuition of approximately one-fourth of the entire undergraduate student body. It also exceeds the \$1,143,600 provided by the private and public sponsors of faculty research.

The University makes its contribution to research in two special ways: one, by reducing the teaching

loads of the faculty thus giving them time and encouragement to develop their personal scholarly careers and, two, by making available major physical resources for this purpose. For instance, few people fully realize the demands of research for library facilities and for specialized books and journals. Also characteristic of the University's involvement is the use of every obscure nook and cranny in the academic buildings for housing the tools of modern research. Many a laboratory has a blackboard wall to memorialize the fact that it was originally intended as a classroom. More efficient class scheduling over a longer working day has made possible this diversion of classroom space to research use.

The University's sponsorship of research and scholarship in the College of Arts and Letters approaches the level in the College of Science. This stems from Notre Dame's determination to preserve a balance in its academic life in keeping with its tradition as a liberal arts school.

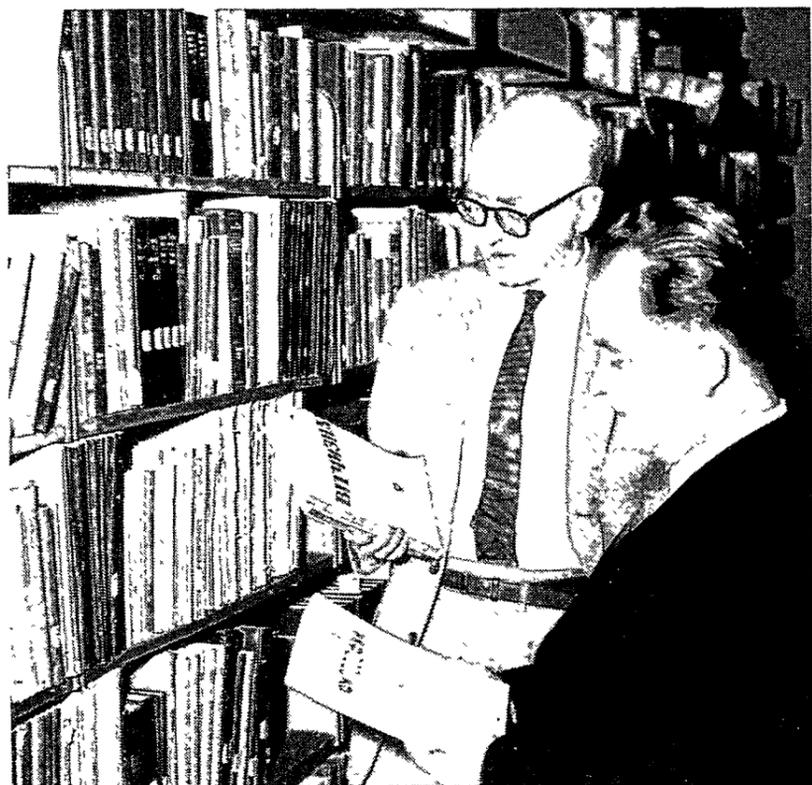
In Science, on the other hand, every University dollar is matched by two from outside sponsors. The University's contribution to research in science is the foundation of a program that continues to grow especially rapidly under the stimulus of the national interest in promoting scientific research.

The relatively smaller University research contributions to Engineering, Commerce and Law reflect some of the uncertainties about what constitutes research in these professional disciplines and how it should be organized. The present deans of these Colleges are leading their faculties into significant programs compatible with their interests and capabilities. The next two years will see dynamic research of increasing importance in engineering, commerce and law.

A crucial point related to the financial well-being of the University as affected by its research aspirations is also illustrated in this chart of research expenditures.

Every dollar contributed by sponsors spawns a need for a dollar from the University. Granted that more opportunities for personal research and scholarship must be provided a faculty developed to or acquired at increasingly higher level of capability, then it becomes clearly a major burden and responsibility of the University to generate the necessary financial support. Neither the federal government nor the private sponsors can solve this problem. Only the unrestricted giving of our alumni, friends and benefactors can sustain Notre Dame in this and her other commitments to excellence.

Dr. John Fizer (right) and Dr. Eugene Pyziur are members of the Center for Soviet and East European Studies in the Department of Political Science.



Mr. Edward J. J. Tracey, Jr.
 306 Sunrise Terrace
 State College, Pa.

LAW

ELECTRONICS

HUMANITIES

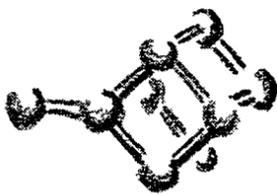
AERONAUTICS

MEDIAEVAL
 INSTITUTE

PHYSICS

RADIATION
 CHEMISTRY

RESEARCH



at Notre Dame

SOCIAL
 SCIENCES

LOBUND



Scientific research at Notre Dame has been dramatically highlighted in the past with notable achievements. Some of these include Father Nieuwland's formula for synthetic rubber and the sending of the first wireless message in America by Professor Green. More recent experiments in laboratories and workshops have been concerned with dental caries, cancer, heart disease and amoebic dysentery in Lobund's germfree center; with supersonic tests in the Department of Aeronautical Engineering; and, with peacetime applications of atomic energy.

Other research at Notre Dame is related to the humanities, law, and the social sciences. The Mediaeval institute has been a fascinating development in higher education which seeks to translate the underlying principles of Christian civilization into the language of contemporary men. The Natural Law Forum and the Maritain Center are significant and distinctive research projects which have made influential contributions to the intellectual life.

In Notre Dame's current ten-year \$66.6 million program, \$11,000,000 has been allocated for research. Alumni and non-alumni friends are invited to help provide the financial means which will further the University's academic excellence and realize its hopes for the future.

NOTRE DAME'S 1958-67 PROGRAM

1. Endowment for Increased Faculty Salaries...\$27,000,000	Additions to
2. Contributions for Research..... 11,000,000	a) Commerce\$ 500,000
3. Student Aid 5,000,000	b) Law 500,000
4. Special Funds for Administrative Purposes... 5,000,000	c) Engineering 500,000
5. New Buildings 18,600,000	Library 5,000,000
	(2) Graduate Halls..... 2,500,000
	Priests' Faculty Building... 1,500,000
	Maintenance Center 600,000
	Auditorium 3,500,000
	Fieldhouse 4,000,000

TOTAL \$66,600,000