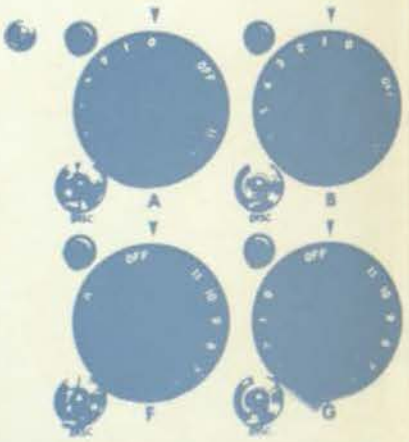

UNIVAC 1107
THIN-FILM MEMORY COMPUTER
Notre Dame
insight
spring
1967

## Cover Story

*Our SPRING cover, depicting man in his computerized world, comes as a way of introducing this issue's two main features. The first is concerned with the University's Center for the Study of Man in Contemporary Society. Creative in its functioning and decentralized in its formal organization, the Center acts as a broker for a series of research projects concerned with the most critical social problems confronting man. Following it, INSIGHT takes its readers through a photographic tour of Notre Dame's Computing Center while talking with its director about the role of computers in the contemporary world. Together, both stories impart the University's emphasis on man himself and the world he creates.*



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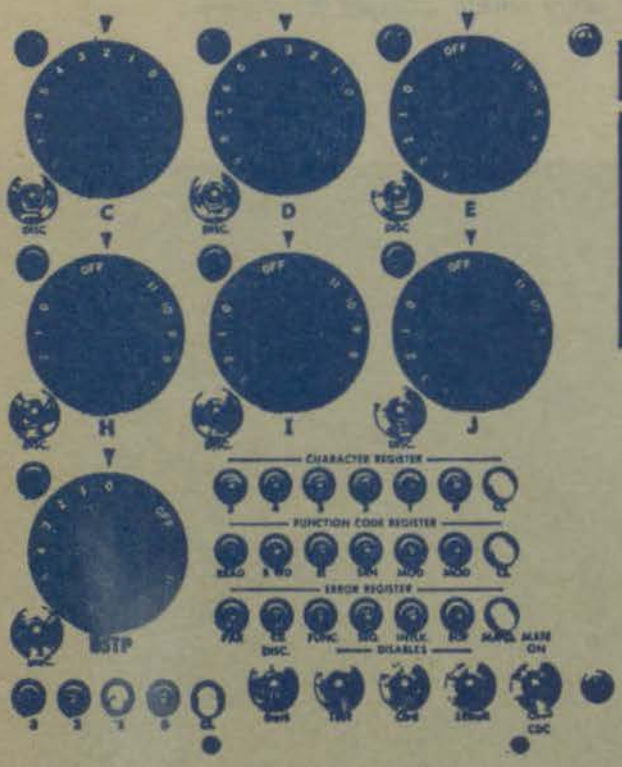
spring 1967 spring

# Notre Dame Insight




*the continuing story of a great university*

VOL. II NO. 1

# TENOR

*The mountainous piles of snow that paralyzed South Bend in late January have disappeared. Clear, sunnier skies dawn almost daily, reawakening the entire campus green. Warmer days also mark the emergence of the student body from its winter's long hiatus with books and steam heat. For undergraduates spring is a welcome season lending a touch of inspiration, an air of lollygagging and the carefree urge to caper. From the shores of both lakes, to the sun-baked slated lawn benches and the perch atop a second story window, students respond to the call of spring. Elsewhere, groundskeepers have begun their perennial manicure of shrubs and lawns while other workmen, from on top rising new structures, assume a furious pace after a winter's slack. This is spring at Notre Dame, a season not particularly identified with any one activity but with many. The tenor is that of a community vibrant with new energies and ambitious designs all directed to a commitment of excellence. Whether it be in striking new educational programs, in dramatic research and development or in daily public service, its character and allure remain uniquely the same—always Notre Dame.*

# TENOR TENOR

**New Zip for the PO.** The fourth US Post Office to serve the Notre Dame-St. Mary's community in 116 years was dedicated February 12. The Lincoln Day affair marked a modern new generation of postal service first begun in 1851 when Rev. Edward F. Sorin CSC was appointed postmaster by President Millard Fillmore.

An American flag, flown over both the nation's Capitol and the US Post Office Department in Washington, was presented to Notre Dame's postmaster, Bro. Eli Pelchat CSC, by Indiana Congressman John Brademas. The principal speaker for the dedication was Richard J. Murphy, assistant postmaster general. The ceremonies closed with a blessing of the new building by Rev. Theodore M. Hesburgh CSC, president of the University.

The new buff brick building is more than twice the size of its 33-year old predecessor. Designed to zip through the more than one million pieces of mail handled each month, the new post office features such conveniences as air conditioning and a service lobby with open counters replacing the familiar caged windows. A separate lobby will provide 24 hour access to boxes and stamp machines.

The new Notre Dame Post Office

**Innovation.** Experimentation in the world of the physical sciences is a never ending process, an adage Notre Dame's College of Science has continually extolled. The most recent endeavor at the University's Nieuwland Science Hall is the introduction this spring of an "audio-tutorial" laboratory in the College's Unified Science Program for non-science majors. This innovation—currently on a trial basis in the life science or biology-oriented phase of the program—serves the purposes of both efficiency and effectiveness. In place of the conventional science laboratory, this workshop-type laboratory is organized into a series of individual, soundproof cubicles each specially equipped with a movie projector, screen, tape recorder, microscope and other essential equipment.

Demonstrations are performed individually for the students via the audio-visual equipment. Furthermore, each student conducts his laboratory period at his own convenience instead of at a formally scheduled class meeting. It is with reference to this feature that the director of the Unified Science Program, Dr. Emil T. Hofman, points with particular pride. "Now," says Hofman, "a student can take as much time as he feels is necessary to work on any one lesson. However," he continued, "the responsibility is his."

Dr. Julian F. Haynes, assistant pro-

Latest experiment in the College of Science

fessor of biology and one of the originators of the unusual Notre Dame program, noted that this new approach has enabled a 75-member class to cover considerably more material and more thoroughly than under the conventional circumstances. "With the audio-tutorial aids providing the actual demonstrations on a individual basis," noted Haynes, "it now is possible for the instructors and graduate assistants to spend more time and effort giving personal guidance to the students on their laboratory projects." Barring unforeseen difficulties, the College of Science plans to expand this approach into the earth and space science studies of the same program.

General William C. Westmoreland

**Patriot.** Fourteen years ago the Senior Class began the custom of selecting a "Patriot of the Year" to be honored at their annual Washington's Birthday Exercises. This year, for the first time, the award was conferred in absentia to General William C. Westmoreland USA, commander of the US Military Assistance Command in Vietnam.

A 1936 graduate of the US Military Academy at West Point, the general is a veteran of World War II and the Korean War. General Westmoreland returned to his Alma Mater in 1960 to assume the post of superintendent. An outstanding artillery officer, he was awarded the John J. Pershing sword at West Point for leadership and military proficiency. A logarithmic fire-direction and control chart he developed is still in use today.

The extreme press of his duties as commander of over 400,000 servicemen prevented General Westmoreland's appearance on campus. Col. John J. Stephens USA, professor of military science at the University, accepted the Patriot award on behalf of General Westmoreland at a private dinner attended by University and Class officials. Senior Class President Patrick Nash also presented to the University the American flag to be flown for the first time on commencement day, June 4.

**Irish Teahouse.** Ever expanding to new horizons, the University's Sophomore Year Abroad Program has reached the Land of the Rising Sun. Beginning in September, 1967, 10 second-year students will pursue their studies at Japan's Sophia University. Situated in the heart of Tokyo, the Jesuit-administered school offers a full university program to Japanese students and caters to the city's large foreign population through its unique International Division.

The Notre Dame students are slated to participate in a specially prepared program designed to give them a familiarity with the history and culture of the Orient. Among the courses they will study are religious history of the Orient, social science, comparative literature of the Orient, Oriental history and beginning Japanese. With the exception of the language course, all material will be taught in English by the faculty of Sophia's International Division.

Like their counterparts in Notre Dame's two other overseas programs —Innsbruck, Austria and Angers, France—Sophia-bound students must be enrolled in the Colleges of Liberal and Fine Arts or Business Administration. A major difference in the programs, however, will be the language factor. Students in the Sophia program will not be expected to demonstrate an academic competency in the Japanese language. However, they will be given instruction in elementary Japanese and are expected to have a vocabulary of 300 to 400 words when they depart late this summer.

**A Bit of the Old Sod.** Irish wit and tempers took the stage in early February as the Notre Dame-St. Mary's Theatre presented its season's third production, "The Playboy of the Western World." Dating from the Irish Renaissance era of Dublin's Abbey Theatre, John Millington Synge's comedy captures the spirit and language of the Irish peasant. Set entirely in a rural pub, the comedy focuses on the local citizenry's transformation of farmer Christy Mahon into the playboy of the title.

Directed by Dennis J. Hayes, assistant professor of the drama department, the play co-starred freshman Robert Allen as the roguish Mahon and SMC's Judy Muench as the infatuated pub keeper's daughter, Pegeen Mike. A seasoned supporting cast found Terry Francke in the role of pub keeper, Michael James; Marcella Lynyak played the marriage-seeking widow Quinn; Robert Reidy was cast as the well-intentioned but weak-willed suitor; and Thomas Haley appeared as the irate father of the playboy.

Under the alternating plan of the combined ND-SMC theatre, the production was staged in Notre Dame's Washington Hall. Upcoming on the theatre's schedule is Jean Giraudoux's "The Madwoman of Chaillot" and the spring musical, "How to Succeed in Business Without Really Trying."

**Wherewithal.** Its fiscal year ending June 30, the University closed its books for 1965-66, balanced its figures and in late December issued its annual financial statement. And again, as in preceding years, Notre Dame experienced a record level of expenditures and revenues.

For the accounting period past, educational expenditures increased 13 percent while the chief offsetting revenues—tuition and fees as well as scholarships and other grants-in-aid—increased only 10 percent. The three percent differential, amounting to $600,000, was funded by other sources of revenue.

On the brighter side of the ledger, the endowment fund in this last fiscal year increased 12 percent or $4,370,000; the plant fund—additions to physical properties—enlarged eight percent or $4,464,000; and student loan funds increased 18 percent or $370,000.

Salaries, wages and staff benefits continue to claim the largest portion of current operating expenditures. For the year 1965-66, a total of $16,546,997 was paid directly to or deposited for the benefit of employees, representing 54 percent of the total operating expenditures of $30,816,251.

Since 1959-60, total current expenditures have increased 64 percent. Salaries and wages and staff benefits have grown by more than 68 percent over the same period from $9,837,233 to $16,546,997, an average of $1,118,000 per year.

Though a private institution, the University reports publicly its financial operations and condition each year principally because of the vast financial support it receives from individuals, corporations and foundations across the country.

Scene from "The Playboy of the Western World"

# TENOR

**Computerized.** Despite Indiana's record snows and accompanying sub-zero temperatures in late January, progress on the construction of the University's $8 million Athletic and Convocation Center proceeds on schedule. With work continuing at this pace, completion of the entire building is planned for the fall of 1968, thus assuring occupancy in the 12,000 seat arena for the 1968-69 basketball season.

The construction scheme of the A and C Center is somewhat unique for it has been utilizing a computerized program called the "critical path scheduling" system. In conjunction with a consultant from Washington, D.C., the prime contractors developed a program for construction to outline the more than four thousand major construction activities and operations, most of which are duplicated anywhere from 10 to thousands of times each. This diagram was then reduced to computer input which subsequently produced an itemized daily work schedule for all trades. With construction now in progress, the schedule is regularly reviewed, adjusted and updated under the direction of the architect's field office representative.

Some of the significant points in the construction schedule are: completion of the middle section's roof by mid-April; start of brick laying by April 1; complete erection of the south dome by August 1 and the north dome by October 1; and the enclosure of the entire building by October 1. Fans coming to home football games will see the entire building's silhouette completed this fall.

Construction continued on schedule throughout the entire winter on the University's Athletic and Convocation Center

## Highlights 1965-66

### Financial Operations

| | |
|---|---|
| Revenues and other additions for combined operations | $30,758,185 |
| Revenues for educational purposes — Current General Fund | 14,025,671 |
| Revenues from student fees | 8,592,376 |
| Gifts, contracts and grants — all funds | 13,525,507 |
| Expenses and other reductions for combined operations | 30,816,251 |
| Expenses for educational purposes — Current General Fund | 14,036,164 |
| Student aid, including loans | 2,450,016 |
| Cost of additions to properties | 4,717,615 |

### Financial Condition

| | |
|---|---|
| Endowment at book value | $39,090,858 |
| Endowment at market value | 46,354,678 |
| University retirement plan funds at book value | 1,231,648 |
| University retirement plan funds at market value | 1,484,136 |
| Properties at book value | 44,767,068 |
| Properties at insured replacement value | 80,289,500 |

**Enter More Sophs.** Varsity athletes in Notre Dame's Class of '69—this year's sophomores—have attained prominent status in the University's world of sports early in their careers. Beginning with the nationally acclaimed trio of Hanratty-Seymour-O'Brien, this year's varsity yearlings continue to stand out in practically all of the University's winter sports. Spearheading ND's basketball resurgence are three sophomores who happened to be the one-two-three scoring and rebounding punch of the ball club. Bob Arnzen, 6-5, from Ft. Thomas, Ky., led the team in scoring with a better than 21 point per game average; Bob Whitmore, a 6-7 center from Washington, D.C. and the team's leading rebounder, posted a 16 point average; and Dwight Murphy, a 6-2 guard from Kansas City, Kansas recorded an 11 point average. Meanwhile on the track portion of Notre Dame's Fieldhouse, a pair of sophomores have set their sights on several school records. Dave Hurd and Ole Skarstein, entering varsity competition under the coaching of Alex Wilson, compete in the same events—the 60 and 300 yard dashes—and usually team up for the sprint medley relay. Both Hurd and Skarstein set a new Fieldhouse and team indoor record with a :31.0 time in the 300 yard dash. In the 60 yard dash Hurd has the best time this year with :06.2 although he was clocked in his freshman year at :06.0. And finally, in swimming, freestyler John May from Riverside, Conn., in his first year's competition has already shattered two varsity records with a :50.4 in the 100 yard freestyle and a 1:52.3 time in the 200 yard freestyle.

Bob Arnzen


Bob Whitmore


Bishop Raines and Father Hesburgh

**Christian Co-op.** When the Clay Methodist Church of South Bend banded together as a parish last year, the first major hurdle the young congregation faced was finding a place to hold their Sunday services. The University, made aware of the Church's plight via a handball game between a South Bend Methodist and a Notre Dame vice-president, offered the use of its Engineering Building, and within a short time a major step in active ecumenism had begun.

January of this year marked a special occasion for the parishioners. Bishop Richard C. Raines, president of the Methodist Council of Bishops, granted the parish its formal charter of organization. At the same time, the Bishop presented a plaque to Notre Dame President Rev. Theodore M. Hesburgh CSC in appreciation for providing the Clay Church interim facilities. In accepting the token, Father Hesburgh called to mind the role a Methodist had played early in the life of the University. When Notre Dame's charter of incorporation was written in 1842, it was a Methodist state senator who sponsored its passage in the Indiana Legislature.

The Clay parishioners will continue to meet on the campus until their church can be built. Hopes are high for an April starting date.

Dwight Murphy

Bill Hurd

Ole Skarstein

John May

# Center for the Study of Man

*Money and machinery, both sophisticated creations of human effort, are today employed to solve some of the fundamental problems of their originator, MAN. Led by Dr. George N. Shuster and his team of social scientists, the University's own unique Center for the Study of Man increasingly has been involved in the challenges confronting modern man in his society. An indispensible agent for research and action programs, the Center's probings range from drug addiction to the rehabilitation of parolees.*

THREE FLOORS BELOW the presidential penthouse in Notre Dame's towering Memorial Library, there is a white-walled labyrinth of intellectual activity known as the Center for the Study of Man in Contemporary Society. One office in this maze belongs to Dr. George N. Shuster, director of the Center. And the 72 year old native of Wisconsin, whose political and scholarly career have taken him as far away as pre-World War II Germany, directs the Center with shrewd, paternal care.

Dr. Shuster, who sits with his back to a window through which, on a clear day, he can see all the way to Michigan, begins to define the Center for the Study of Man in Contemporary Society. He explains that in 1961, upon his return to his alma mater, he was given the mandate to found a facility that would "stimulate, assist, promote and participate in research strictly for the social sciences and the humanities." But more important, it was to become an agent between the problems of human society and the foundations and scholars eager to research and alleviate these problems.

To date, this purpose has been fairly well confined to the College of Liberal and Fine Arts. He estimates that the departments of sociology, government and international studies, and economics have benefitted most from their activities with and in the Center, but he adds with a smile, "I would rather have them say it."

The humanities research center is basically an amalgamation of ideas fostered by Dr. Shuster, who is also assistant to the University's president. Remarking on the conceptual idea of the Center, Dr. Shuster speaks of what he terms its "seedbed philosophy. The idea of the center is to force-feed research projects to the point where they produce significant results and then continue them on their own."

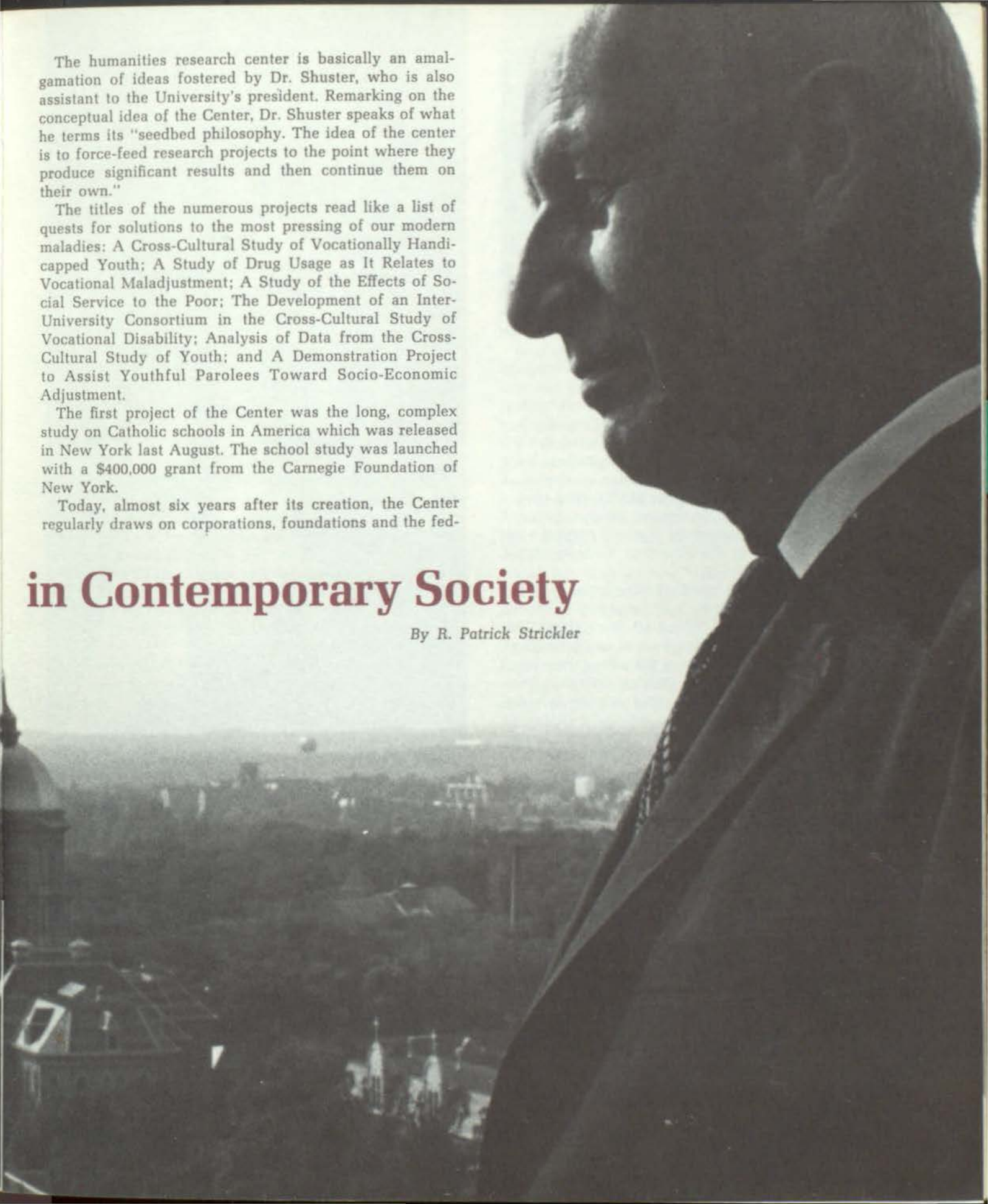
The titles of the numerous projects read like a list of quests for solutions to the most pressing of our modern maladies: A Cross-Cultural Study of Vocationally Handicapped Youth; A Study of Drug Usage as It Relates to Vocational Maladjustment; A Study of the Effects of Social Service to the Poor; The Development of an Inter-University Consortium in the Cross-Cultural Study of Vocational Disability; Analysis of Data from the Cross-Cultural Study of Youth; and A Demonstration Project to Assist Youthful Parolees Toward Socio-Economic Adjustment.

The first project of the Center was the long, complex study on Catholic schools in America which was released in New York last August. The school study was launched with a $400,000 grant from the Carnegie Foundation of New York.

Today, almost six years after its creation, the Center regularly draws on corporations, foundations and the fed-

# in Contemporary Society

*By R. Patrick Strickler*



Dr. George N. Shuster

Hugh P. O'Brien and Frank J. Fahey

eral government to provide the wherewithal that has kept the academic community healthy in the mid-20th century. There are seven projects at the Center with federal funding alone amounting to over a million dollars. Several other awards have been made to Notre Dame's Center for the Study of Man for a Latin American Studies program. Four additional research projects at the Center, exclusive of those operating on awards less than $5,000, total over a quarter of a million dollars in support monies. Included in these is a second Carnegie grant that will support a detailed look at finances in the American Catholic school system.

The research carried on by the Center often goes beyond the University's academic walls and points out the two well-separated sides of the social researcher's life. One is the well-lit, pleasant atmosphere of the Notre Dame library's 11th floor and the other is the nitty-gritty world of society's "losers". Two Notre Dame sociologists, Prof. Hugh O'Brien and Dr. Frank Fahey, currently are involved in Center projects which transverse the walls separating the University from the problems of society.

Prof. O'Brien is directing the study of drug usage as it relates to vocational maladjustment. This spring he will submit a report on the first year-and-a-half study to the Vocational Rehabilitation Administration of the Department of Health, Education and Welfare. The study, which received an initial grant of $60,000 in 1965 and a second grant of $55,000 the following year, has evolved into a mammoth interviewing effort carried out on the sidewalks, in the jails and in the hospitals of New York's "junkie" paradise on East 100th Street.

Asking one question—"How were you introduced to drugs?"—and seeking an answer to one dilemma—"What psychological characteristics might be common among drug addicts?"—O'Brien's research is directed toward "studying the etiology of drug addiction." If the results of the East Side interviews provide enough answers, O'Brien feels he may be able to suggest guidelines that will "lead to restoring (addicts) to economic self-sufficiency."

The interviews, which may be repeated numerous times with the same person to acquire "depth", have reached into the lives of the three major neighborhood groups—Puerto Ricans (60%), Negroes (30%) and whites (10%). Also being interviewed in large numbers are the addicts' siblings. Thus far, results have led the staff to one major conclusion. The methadone treatment, which was originated by a New York hospital, is not working. Methadone is a synthetic, addictive narcotic that is used to stage a withdrawal. Preliminary findings of the Notre Dame study indicate that too many addicts find their way back to East 100th Street and "the needle".

Another venture into the world of society's "losers" is being made by Dr. Frank Fahey who, with a $165,000 grant from the Office of Juvenile Delinquency and Youth Development of the Department of Health, Education and Welfare, wants to know how communities, industry, reformatories and universities can work together to bring ex-convicts back into the mainstream of society and restore them to economic independence. This has proved to be a long, hard problem to solve, Fahey says, and he admits, "We're not sure we'll be successful."

It is a pilot project, he explains, with about 100 men who have been or are about to be paroled from the Indiana state farm at Pendleton. About 30 are out on parole now and live in a K of C hotel in downtown Gary. About half of these men are employed at Inland Steel with the majority doing manual labor, although a few have already risen to white-collar jobs. The other half either were not qualified for jobs at Inland or were fired. One has been sent back to Pendleton for a technical violation of parole and two others are on the way back—they were discovered wielding a crow bar at night at an entrance to a Gary tavern.

"These are tough fellows to deal with," Fahey says, "they do not live for the future. They live for right now." He said most of the men are potentially violent criminals, although none has a conviction for a violent crime. He explains that in the 18 to 25 age range, with which the study is concerned, about 75% of the men are sent back to prison within one year of the day they walk out the prison door. "I would estimate that about one-fourth of these men in the program have pretty severe psychological problems," Fahey says, adding that he feels they are generally immature and easily give into violence when things go wrong.

The purpose of the program, he says, is to orient the parolees for life as law-abiding citizens and to help them find jobs in industry. "We're trying to rectify the reasons why the parolee has not been making it when he gets out," Fahey says. "Things like lousy jobs or no money plague them. They say, 'What can you do?' " He says the staff spends a lot of time beating the bushes looking for jobs for the men who are in the program. "They need continual moral support from the people on the staff once they do get out to help them over the rough spots."

These two programs exemplify ways that good minds and good ideas are being applied in the quest for solutions

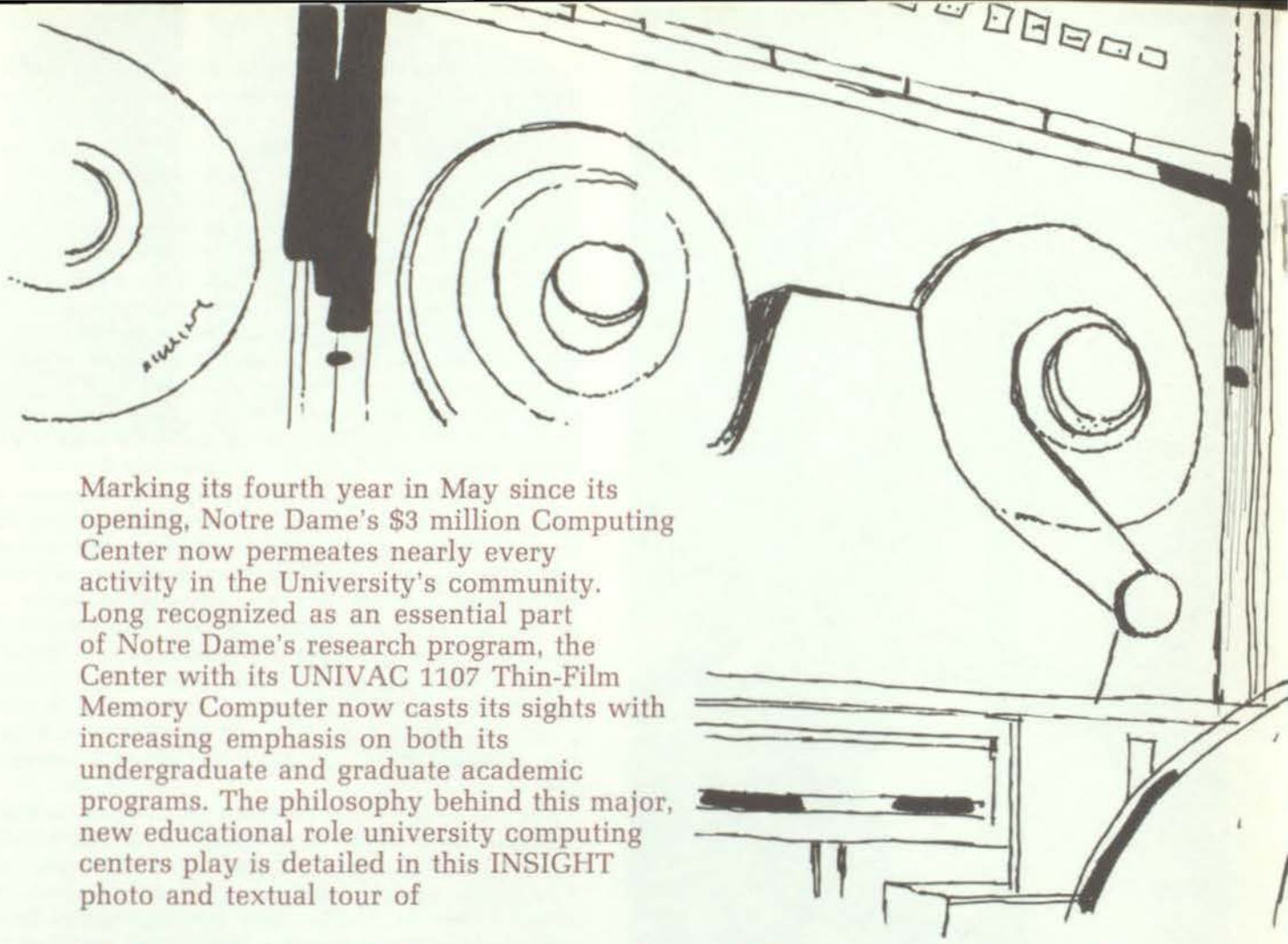
to some modern day pathologies. There are many other programs and projects at the Center whose involvement in the world beyond academic walls is as important and relevant as the O'Brien and Fahey studies. One prominent example is the Latin American Studies program which includes several impressive projects: An Institute for Latin American Research in Population Problems, and the Academic, Administrative and Financial Development of the Pontifical Catholic University of Peru. A Rockefeller Foundation grant has contributed to this research. And, as Dr. Shuster puts it, there are also several grants which have been made to Notre Dame "to assist other programs within the competence of the Center." Some of these are for population studies, the Carnegie renewal, a Philosophic Institute for Artificial Intelligence and an O'Brien Fund which provides "seed money" for research.

One result all this research activity often produces is an interest in the press and the general public, interest that has sometimes proven to be alarming and unwarranted. For example, a woman in St. Louis recently saw newspaper accounts of a Center-sponsored conclave on the Family and Population Change. One story began with the morsel that increasing numbers of American Catholic women between the ages of 18 and 39 are not going along with traditional Church policies on birth control. It took a long, informative letter from a Notre Dame sociologist and conclave official to soothe the woman's outraged disbelief.

And last August, in a "solemn high press conference" in a mid-town Manhattan hotel, the nation's leading writers on education and religion gathered for the first words on the Catholic schools study report, "Catholic Schools in Action". National headlines and front-page stories from coast to coast carried interpretations of the report. Such prestigious periodicals as *America* and *Saturday Review* chose to publish articles on the report and *Time* and *Newsweek* both allocated a few paragraphs in their early-September issues to the report. Both, ironically, used the would-be unique headline, "Report Card".

The director of the Center estimates that while the white-walled, 11th floor labyrinth is now jam-packed with researchers and scholars, and the hum of well-oiled minds can almost be heard when you step off the elevator onto the Center's floor, still more could be undertaken. "We could be doing more now," Shuster says, "but we could use more departments to do it."

*ABOUT THE AUTHOR: Pat Strickler is a 1965 graduate of the University's Department of Communication Arts. Formerly a reporter for the SOUTH BEND TRIBUNE, Strickler was assistant director for public information at Notre Dame when he prepared this article. He has since returned to the newspaper field as a reporter for the KALAMAZOO (Mich.) GAZETTE.*



Marking its fourth year in May since its opening, Notre Dame's $3 million Computing Center now permeates nearly every activity in the University's community. Long recognized as an essential part of Notre Dame's research program, the Center with its UNIVAC 1107 Thin-Film Memory Computer now casts its sights with increasing emphasis on both its undergraduate and graduate academic programs. The philosophy behind this major, new educational role university computing centers play is detailed in this INSIGHT photo and textual tour of

# Notre Dame's Computing C

with **Dr. Don Mittleman**
Director of the Computing Center

photos / Richard Stevens

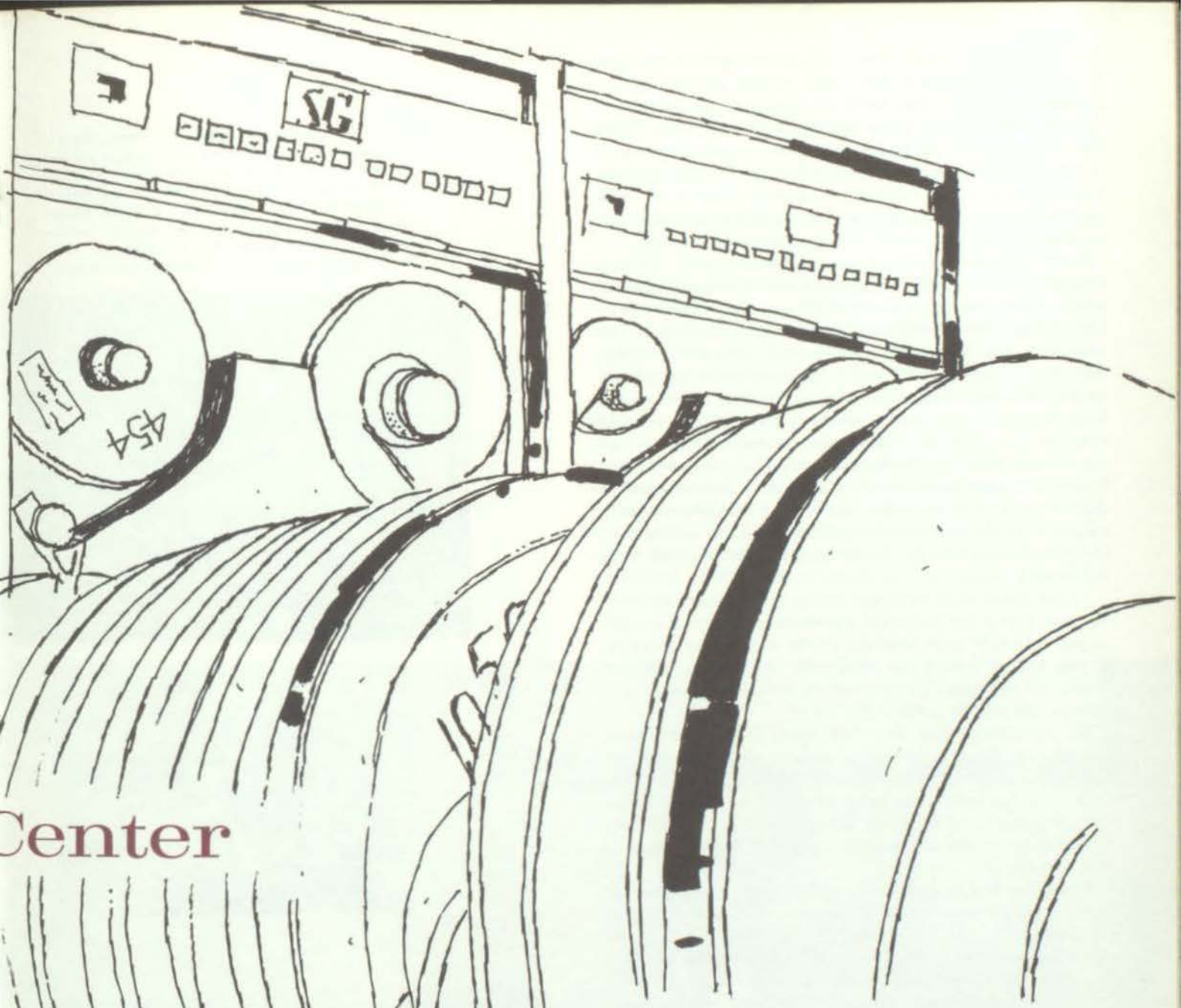
Computing facilities and centers have been springing up on University campuses throughout the country for many reasons. To understand why this is so, I think that one need only examine the very purpose of an education, and particularly a college or university education.

A college or university exists to offer the student the best ideas that man has been able to accumulate. Once these ideas have been presented, the student mulls them over in his own mind and decides for himself how he can best utilize them in his role in life as a rational human being.

Computers are part of the development of human effort. Consequently, people should be cognizant of how their lives are affected and will be further affected by these machines. Thus, we might ask, how did the computer come about, and how is it really affecting man and his environment?

Throughout history, man has continually strived to substitute machines and power for both animal and human efforts. The replacement of the trireme by sails and the invention of the Archimedian screw are evidence of this effort. Also, in our own times—and really not too facetiously—the mechanical pretzel bender as well as the introduction of the automatic cylinder block assembly lines are further evidence.

Man's difficult or monotonous mental tasks also have been alleviated, albeit relatively little, by the substitution of machines. Think, for the moment, of the Roman notation




# Center

for numbers and ask how, using this notation, the rational operations—addition, subtraction, multiplication and division—could have been performed. Do you recall how a shepherd used to keep track of the number of his sheep when he took his flock out to pasture? As each sheep walked past the gate, the shepherd would place a small stone onto a pile and when the sheep returned, a stone would be removed from the pile. If stones remained in the pile, sheep were missing; if the pile were empty, all the sheep had returned; if there were no more stones and still more sheep, where had they come from? While it is possible to perform the four rational operations using piles of stones, obviously one would become physically tired and mentally bored in short order. The Romans, like

the Persians and the Chinese before them, used a machine to avoid the drudgery; the origin of the concept of the abacus (itself a word of Greek origin) seems lost in history.

Now, hundreds of years since the introduction of the abacus and stone piling by shepherds, we find ourselves in the age of the computer. To my way of thinking there are two major arguments for the introduction of computers into our society. The first of these is purely an economic one, the second is a question of morality.

From the standpoint of pure economic gain, we are finding that the benefits to be obtained in terms of greater productivity, greater safety and greater convenience have been tremendously enhanced by the introduction of the computer. We have been able to undertake and perform tasks which are impossible without a computer. For an example, the tremendous scientific calculations which would have had to be performed without the computer would seem to have required thousands of human beings working at desk calculators. Here it is not alone a question of finding out how many people would have been needed to do the work; it is more the fact that one could not assign subparts of the problem to sufficiently large numbers of individuals, and provide the communication between these individuals.

I have heard of an analogue which may be more striking. Assume that a ten thousand horsepower engine is needed to pull a freight train over the Rocky Mountains. Imagine, if you will, replacing the engine by ten thousand horses. Could ten thousand horses—along side and behind each other—succeed in pulling the train?

So we can see that there are problems that have been solved that literally would have been insoluble without this intellectual aid. How advanced and sophisticated do you think our aero-space industry would be today without the computer? Try to weigh the impact and ramifications that the computer has had in only this one segment of our society.

From the highly technical and scientific examples, we can recognize the myriad of less esoteric ones affecting the patterns of our daily lives. The changing attitude toward the increasing use of credit rather than cash can only be attributed to the introduction of the computer. It would be literally impossible for banks as well as the many credit agencies that bombard us with their promises of "live a little now, pay a little later" to have created both the mental and the actual environment that they have if it were not for the existence of the computer. There are just not enough people to record the transactions to have made such an economic change possible. It is the computer alone which must take either the responsibility or the credit, as you wish, for these modifications in this changing way of American life. In fact, I would like to make a slight prediction along these lines. At the present time, when one makes a purchase, there is no discount (as R. H. Macy used to claim, six percent less) for paying cash. In fact, for psychological reasons, it is to the retailer's advantage to get you to use your credit. I have not, as yet, seen the situation where the retailer or the bank will actually give you a discount for using credit, but I would like to speculate that this idea has already occurred to many of them and to predict that in an effort to spur sales it will not be too long before such a discount is offered. I would suspect that the economic and ensuing legal ramifications are almost unpredictable.

Then, of course there is the use of computers in the aesthetic life. In the last few years scholars have begun to learn how computers may be used to better understand musical construction and composition, to better appreciate —by making concordance easy—the intellectual heritage of any one writer both from his contemporaries and from the past. Art forms in the composition of abstract designs have appeared as output and reputable galleries have given

Dr. Don Mittleman, director of Notre Dame's Computing Center, was named to his present position in 1964 after having served for five years as chief of the Computation Laboratory in the National Bureau of Standards in Washington, D.C. A former mathematics professor at Hofstra College, American, Columbia and Catholic universities, Dr. Mittleman holds three degrees including the doctorate from Columbia.

space to such pictures.

In all of the above examples of the variety of uses computers are being put to, I feel that there is a common underlying theme which leads me to my second argument for the introduction of computers into our society.

In his book, *The Human Use of Human Beings*, which appeared in 1950, Norbert Weiner wrote, "It is a degradation to a human being to chain him to an oar and use him as a source of power; but it is an almost equal degradation to assign him a purely repetitive task in a factory which demands less than one-millionth of his brain capacity."

I am really trying to reopen a question which each generation—to include our own—should ask itself. With what is known technologically today, what constitutes "the human use of human beings?" This is the moral question I alluded to previously. We have seen in each of the above examples that an activity which 20 years ago would have been classified as a dignified activity for a human being is actually now being performed by a machine. What is human effort? I would like to propose that an activity which a machine can perform is not an activity to which a man should be bound. This premise carries with it some rather far-reaching implications in that so much of the traditional educational programs and so much of the hu-

man values that we have attached to certain activities require re-evaluation and modification. Some simple ones I have already mentioned, but let me pose the following question. Calculus, as an intellectual discipline, is still taught in most of our colleges. A student satisfactorily completing an elementary course would be recognized, by the general population of our community, as having attained a modestly high intellectual (human?) level. If I can program a computer to answer all of the questions as well as or better than an excellent human student, then has the human student been really exposed to a human activity? Calculus is merely an example.

Suppose I now describe an instance in which the computer has not been the success that had been hoped for. Newspaper accounts appear every year or so describing successful computer translation from one natural language to another. This problem is still far from solved. Analyses of the syntactic structures of natural languages have been made and there have been successful computer programs written which, for example, can translate Russian into English. In fact, the computer translation in some few instances is as good as or better than a translation effected by any but a trained linguist with specialized knowledge of the subject matter. The difficulties that have been encountered arise from semantics and as yet, no acceptable solution is known. The multiple meanings of a word, rather than the syntactic structure of a sentence, seems to lie at the core of the difficulty.

Thus far attempts to create literature, both prose and poetry, by computers have been dismal failures. How does one go about programming a computer to express situations which have emotional impact, because of human experience, on individuals? Frankly, I don't know (but let me add parenthetically) *now*.

I could go on and recite other areas in which activities previously performed by humans and previously considered only capable of being performed by humans have given way to the computer. I have cited a few activities and I challenge you to find more where human ingenuity and knowledge, using the computer, have not been able to intrude into that aspect of human activity which we may want to continue to call human.

It is this challenge which is, certainly for me, a major motivation for working with computers. I am interested in knowing how this device may modify man's traditional ways of doing things and thinking about himself and his environment.

I spoke earlier of the Roman notation for numerals and the need for the use of an abacus to enhance calculational capability. It was 500 years from the end of the Roman Empire to the introduction of positional notation by the Arabs. And yet, if one examines an abacus, one can see the use of positional notation in its construction and in its use. The great achievement of the Arabs was the introduction of an intellectual algorithm rather than the mechanical algorithms previously in use. It seems to me that if man simply solves problems on the modern computer, he is getting to a state similar to that of the Romans when they solved their arithmetic problems on the abacus. The Arabic algorithm provided civilization a major jump forward; we still need to determine the intellectual algorithm which will carry our civilization another great leap forward.

This is something of an insight as to why there must be computers on university campuses. Again, computers are an integral part of our civilization and the university must prepare the student for living in this civilization.

## *WHAT are your undergraduate programs in computing science?*

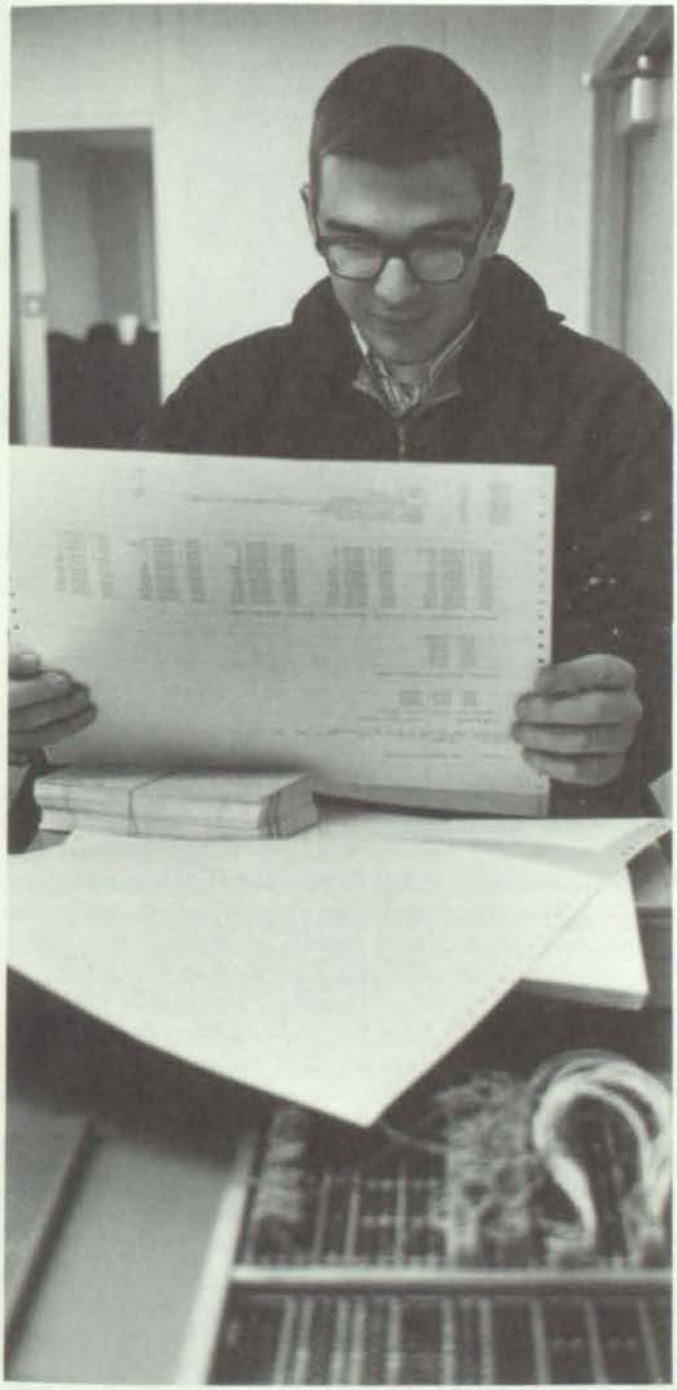
I might term the present attitude being taken within the Computing Center as one of "permissive encouragement". We offer a basic course which introduces the student to an understanding of computers and computing and provides him an opportunity to solve a number of small problems on the machine. From this point on, there are two main paths available to him for his own further development.

For those students who are interested in the computer as an end in itself, we will be offering—beginning next September—a major program leading to a bachelor's degree. The program will be highly interdisciplinary in that for many of our expected undergraduate majors, an area of applications programming will be required. By this I mean that a student with strong interests also in English would be required to take a fair number of courses in the English department with the foreknowledge that there would be a further requirement for him to formulate and solve a computer-oriented problem within the discipline of English. Similarly, students whose interests encompass any of the other disciplines within the College of Arts and Letters, would be required to formulate and solve computer-oriented problems within those disciplines. While I have chosen to illustrate this idea by mentioning the College of Arts and Letters, obviously it would apply to each of the other subject matter areas in each of the other Colleges.

For those students whose interests in the computer are primarily for its applicability to a subject matter area, the basic course, supplemented by those additional computing courses which he would find useful, should adequately prepare him to take, in the various colleges, those other courses for which computational facility is a prerequisite.

Incidentally, President Johnson's Scientific Advisory Committee (PSAC) recommended that every college student in the United States beginning in 1972 should have some exposure to the computer and computing. Presently, between 500 and 600 Notre Dame students each year are taking the basic course. Although computing science is probably the newest department on the campus, we do expect to be able to meet this demand long before 1972.

Computing ideas are beginning to permeate disciplines within the University. This seems to be coming about in a way which is perhaps traditionally different from the



accepted picture. Normally, one expects the teacher to expose his ideas and his methods for solutions of problems to the student. At more advanced levels, the student begins to interact more readily with the teacher and there is a greater exchange of ideas until, at the Ph.D. stage, it is the student who is explaining the results of his investigations. However, now with the rapid assimilation of computing methods by the younger ones, and an appreciation as to how these methods may help solve problems which would not have been even formulated before, our professors are being forced (and so as to not give the wrong impression, happily so) to re-examine their more traditional approaches to their subject matter and to reorient their thinking so as to include these newer techniques. Of course, this represents a transitory phase, but one which will last at least a generation, at least until computing methods have become universally understood and adopted. When this millennium has indeed arrived, it will be necessary to redefine one of the roles that the present computing science departments play in universities.

## *WHAT are your plans for a graduate program in computing science?*

Our plans call for the establishment of a graduate program in computing science or information science leading to a doctorate. At our present rate of growth, such a department should be operational within the next five years.

## *HOW many hours is the computer being used and who are its users?*

In the last two and one-half years we have seen computer usage grow from 2,130 hours in the fiscal year 1965, distributed hour-wise,

| | |
|---|---|
| staff | 749 |
| research | 819 |
| instructional | 446 |
| outside users | 116 |

to 3,050 hours in fiscal year 1966,

| | |
|---|---|
| staff | 541 |
| research | 1629 |
| instructional | 675 |
| outside users | 205 |

to an anticipated 4,400 hours in fiscal year 1967,

| | |
|---|---|
| staff | 500 |
| research | 2500 |
| instructional | 1000 |
| outside users | 400 |

## *WHO are some of your "outside users" and for what purposes are they using the computer?*

Presently, there are about a dozen firms using the University's UNIVAC 1107. It is rather interesting to note the spectrum of uses to which these companies are putting the machine. For example, Carleton Financial Computations, Inc. is computing annuity tables and programs; C. G. Conn and Company is investigating the optimum design of piano strings. And one of the most fascinating research and development problems now being studied is that of Bendix who is designing a landing gear for the moon probe.

Notre Dame's computer is capable of receiving programs and data via telephone lines from users anywhere. In fact, we have received problems and transmitted solutions on an occasion both to New York and Los Angeles. On a

regular production basis, there are three firms in the Detroit area who connect their small computers (primarily input-output devices) to the UNIVAC 1107. Both the Wyandotte Chemical Company and the Ethyl Corporation are solving linear programming problems. More recently, Ethyl has been coding and debugging FORTRAN written problems via their remote station. The architectural firm of Giffels and Rosetti also has put the 1107 to use in their work. Also from Michigan, but this time from St. Joseph, the Whirlpool Corporation has leased a telephone line running from their computer directly to ours. They have made extensive use of the 1107 in the solution of many scientific and engineering problems related to their product development. Most of the others who use the facility are engineering firms whose interests range from the design of a single bridge, a single building, a single road to urban renewal projects for city planning.

We recognize the growing interdependence of the University and the community and are delighted to make our facilities and our talents available toward the solution of these problems. We also recognize the increasing demands placed upon educational institutions to prepare others to use this tool. Thus, we have made the 1107 available to St. Andrew's University in Berrien Springs and Lake Michigan College and Michigan State University Center—both in Benton Harbor—for instructional use of students enrolled in computing science courses at these schools.

## *WHAT are some of the research projects utilizing the computer? Are any administrative branches of the university using the computer?*

Undoubtedly the future belongs to those who find new uses for the computer. Each of our four colleges has both faculty and students searching for these new uses. Just a few examples of the more than 100 research projects currently underway will give some flavor of the breadth and variety of this research. Professor V. Paul Kenney and his group in high-energy physics are using the computer to search for new elementary particles and to test the basic hypotheses of physics. Professors Edward Crandall and Raymond W. Flumerfelt are using it to perform analytical studies of the human respiratory system. In the College of Business Administration the computer is used to study the interaction of marketing management decisions and to provide experience in trying to manipulate the highly complex structure of our economy. While you may have surmised that the computer was used in the study of Catholic education—as reported in the FALL issue of INSIGHT: Notre Dame—it has found additional sociological applications in the study of prisons, prisoners and the adjustment of ex-prisoners to the community under the direction of Prof. Frank Fahey. It is being used in "A Computer Analysis of Rhetorical Patterns in the Prose of John Marston" by Prof. Paul A. Rathburn. Prof. William Davisson has been reconstructing segments of the early economic history and development of this country from all available shipping records and other sources, such as estate inventories.

In addition to these faculty research activities, there are other University users who take advantage of the computer's capabilities. The faculty and staff payroll and major segments of the accounting system have been programmed and are running on the computer. Student registration, grade averaging and class assigning also have been programmed and are being processed. The Library now is studying the automation of acquisition of new books, general circulation and—what is undoubtedly one of the most difficult problems facing man today—automated information storage and retrieval. This one subject, with all of its ramifications, is almost tantamount to the whole of current research with and by computers.

## *WHAT is the future potential of Notre Dame's computing facilities?*

If you think of the University as a small city consisting of nine thousand people with a post office, fire and police

departments, hotel, golf course, maintenance problems, etc., you might ask—just how computerized can such a city become? There are no limits to what one might imagine, but there are limits of financial practicability.

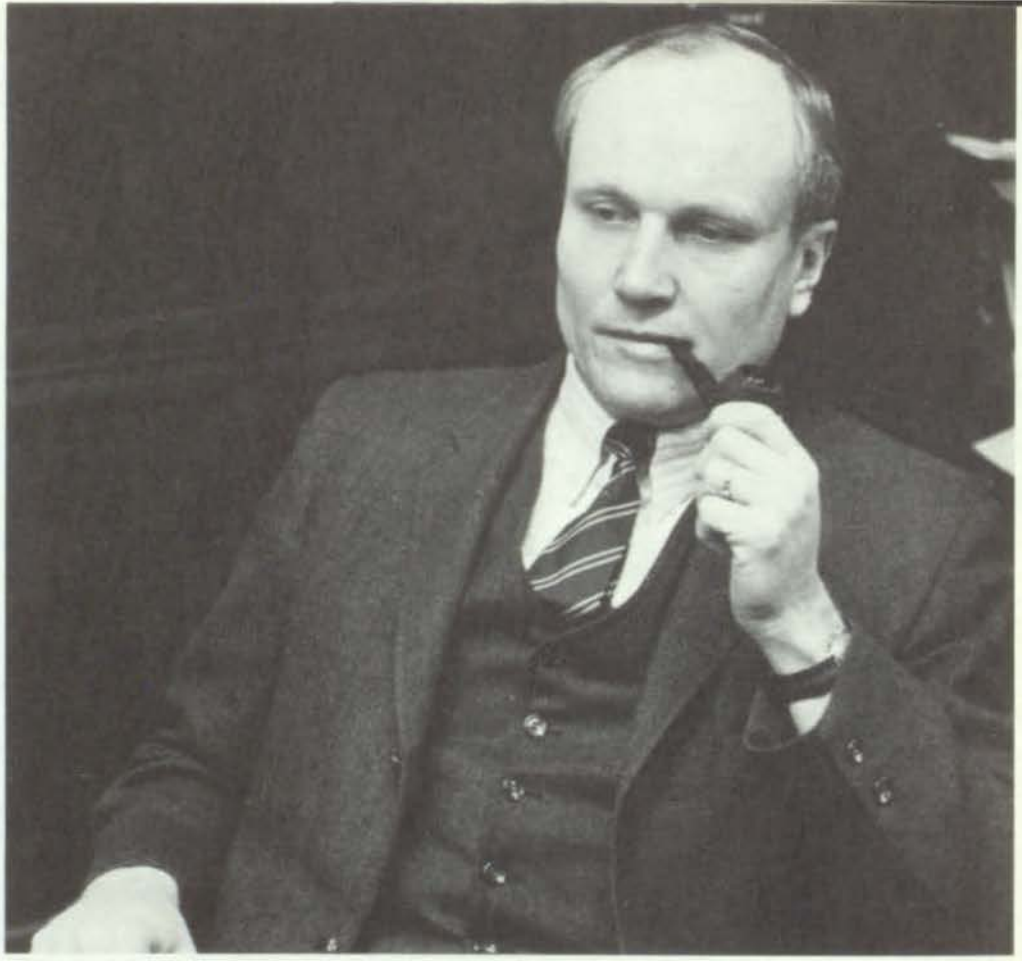
Most problems of an administrative nature that would be required to computerize this city would not place too heavy a demand on the present UNIVAC 1107 although this is *not* the right equipment to use. While we may improve in any one instant the overall performance of an administrative office by providing computerized techniques to that office, we still are a generation away from providing the kind of service that we know is technically feasible today. The generation I refer to is a "computer generation". Notre Dame has a "second generation" computer; "third generation" computers are needed if we are to provide the man-machine interaction which, for example, you have come to expect in such areas as airline reservations and which are needed for computerizing the activities of our administrative offices.

Fortunately, the possibility of acquiring a "third generation" computer does not depend solely on our administrative needs. The growth of computer usage by our faculty in all four undergraduate colleges and graduate school continues. On the one hand, more faculty are becoming involved and on the other, as each individual learns more about this potential of the machine, he formulates new problems, some of which are beginning to tax even this computer. For example, one professor needed over 400 hours of computer time for a problem in hydrodynamics. Another professor last December used 137 hours in trying to model the general circulation of the earth's atmosphere.

As these larger, more difficult computational problems present themselves, we shall run out of available computer time and be forced to acquire a newer, faster one. However, the developing technology is providing not only increased speed ("third generation" computers seem to be at least ten times as fast as "second generation" ones) but is providing also a multiple access capability. Whereas today, our 1107 basically solves one problem at a time—when it finishes one, it starts on the next—we expect that the next computer acquired will have the capability to work on many problems concurrently. Whereas today, our users line up one behind the other in submitting their problems—and wait one behind the other for the results to come back—we expect that with our next computer there will be multiple channels for users so simultaneously many people may submit their problems and simultaneously receive their results. Furthermore, by giving an individual personal access to a large computer, he will be able to formulate and solve problems by interacting instantaneously with the machine heretofore impossible because of the intrinsic complexity of the problems.

Thus a "third generation" computer will become a faculty research necessity—if it's not already—because of its needed additional speed and time-sharing capability. Eventually, the spill-over to the administrative needs will become economically feasible and we shall see a rather advanced automated technology in our administrative offices. We shall be doing basically the same jobs, but doing them better, more efficiently, and what is more important, providing better service to the students, the staff and the faculty.

# FACULTY SKETCHES



## Harry C. Saxe

"Engineering is in a period of transition," believes Dr. Harry C. Saxe, Notre Dame's acting dean of the College of Engineering. "It is a time when specialized fields are coming back together. Actually, the person with the broad understanding of basic engineering principles will be the best equipped to cope with the problems of the future."

Dr. Saxe, a graduate of the City College of New York and the Massachusetts Institute of Technology, defines the function of civil engineering as the providing of suitable structures for mankind. Specifically, he points to routes of communication, structures and the harnessing of water as the three general areas of concern.

Himself a specialist in structural theory and design, Dr. Saxe most recently has concentrated his research and teaching in the area of water and the problems associated with it. As head of the Department of Civil Engineering he received a National Science Foundation grant in 1964 to develop an interdisciplinary program in environmental health. Focussing on water pollution, the environmental health study is a cooperative effort between the civil engineers and the departments of biology and microbiology. Moreover, it is fast becoming a prototype of the interdisciplinary programs that the increased complexity of man in his technological environment will demand of the academic world.

"It is an ambition within the field of engineering," believes Dr. Saxe, "to have a really strong interdisciplinary program. To do so, however, will require better educational programs which will allow engineering schools to experiment with their training." With this aim in mind, Dr. Saxe, now in his second term as acting dean of the engineering school, is carrying on the work of reevaluating the engineering curriculum.

Dr. Saxe joined the University's faculty as chairman of the Department of Civil Engineering in 1959 after having taught at the University of Cincinnati, the Polytechnic Institute of Brooklyn, Georgia Institute of Technology and the University of Florida. In 1960 he was appointed acting dean of the College of Engineering for the first time.

## Stephen D. Kertesz

Dr. Stephen D. Kertesz conducts his courses in diplomacy and international law with the authority of an experienced practitioner as well as a celebrated academician. A native of Hungary, his professional vita spans a career that has led from law to political science to diplomatic service to the world of academe.

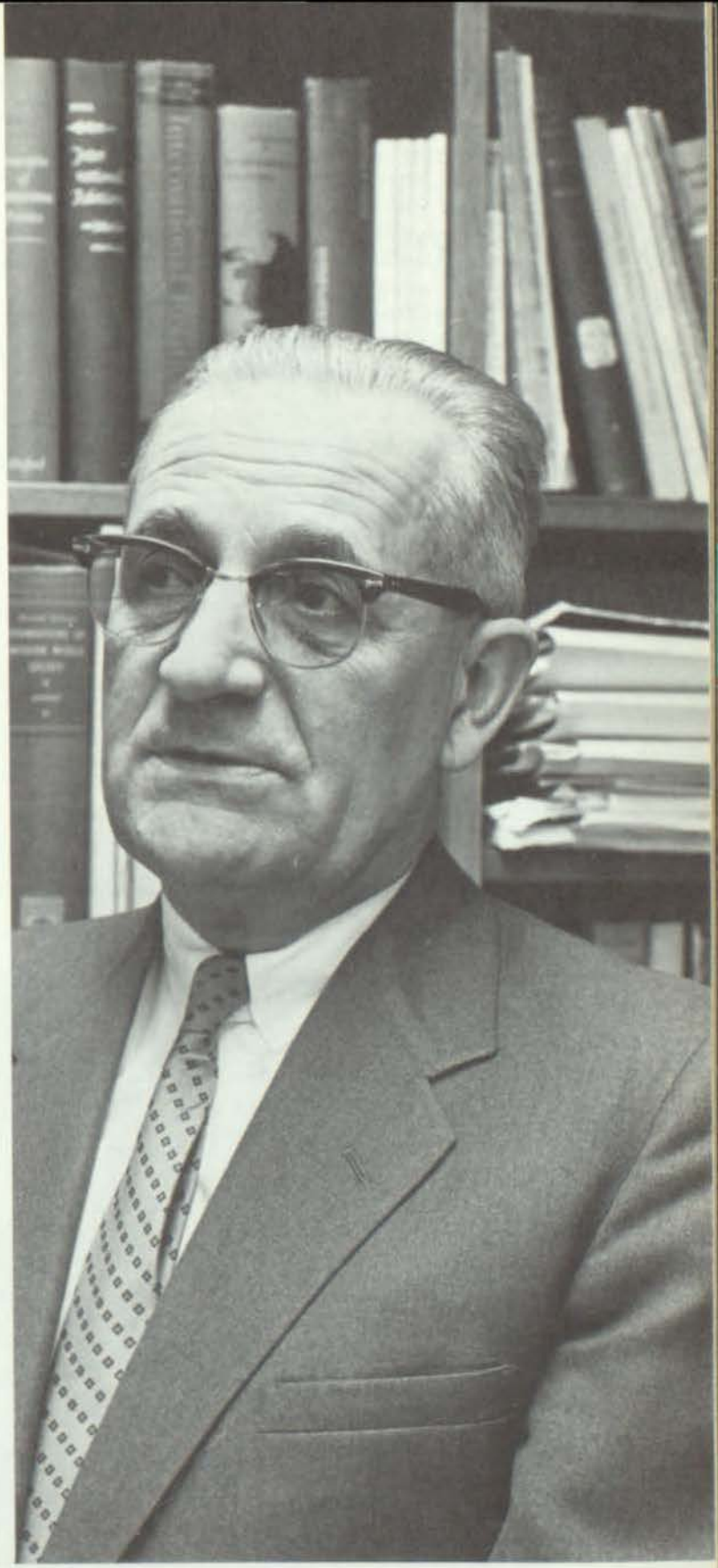
Prof. Kertesz draws his practical experience from several years service as a member of the Hungarian Foreign Office and as chief of the division of international relations in the Ministry for Foreign Affairs. His specialties—diplomacy and international law—are fields in which he has contributed considerably through a tenure as government representative to the Mixed Arbitral Tribunals and the Court of International Justice at The Hague and diplomatic assignments which have included appointments as Minister-Counsellor in Paris and Hungarian minister to Italy. In addition he was secretary general of the Hungarian peace delegation to the Paris Conference in 1946.

His credentials as a Franklin Miles professor in the Department of Government and International Studies include a doctor of laws from the University of Budapest and a diploma from the Institut des Hautes Etudes Internationales de l'Universite de Paris.

Within universities, he notes, international studies are a barometer of changing world conditions. "Today's students are much more interested in international problems and diplomacy and are able to absorb infinitely more than students of 10 or 15 years ago."

To meet this challenge for international knowledge, the Department of Government and International Studies has initiated three area programs of interdisciplinary studies in Soviet and Eastern European countries, Latin America and Western Europe. Dr. Kertesz's direction of the two European programs is strengthened by his firsthand knowledge of Eastern and Western European nations and the effect of Soviet policy in these areas. Just recently, he completed a study of new diplomatic methods and national attitudes of Western European and North American governments supported by a Guggenheim Fellowship and a Senior Rockefeller Grant. The results of his three study-trips to Europe soon will be published in a book entitled, *Quest for Peace Through Diplomacy*.

Coordinating and initiating research and publications is another of the professor's contributions to the University. As head of the Committee on International Relations, Dr. Kertesz superintends a harmonious relationship of international research activities between the various academic disciplines. Thirty-five such studies have been published in the well-known International Studies Series published by the University of Notre Dame Press. The Committee also sponsors symposia. One of the foremost was "Marx and the Western World", a 1966 conference that brought to Notre Dame the world's leading scholars on Soviet philosophy.



## Rev. Ernan McMullin

The movement away from strict Thomistic courses in the philosophy programs of Catholic colleges is far from an alarming situation believes Rev. Ernan McMullin, chairman of Notre Dame's philosophy department. The Irish-born diocesan priest—whose diocese is in Donegal—views the introduction of a variety of philosophical approaches into the college curriculum as one remedy to a long-standing imbalance. "In stressing Thomism it was easy to forget how Thomas Aquinas himself had been formed." St. Thomas, according to Father McMullin, as a student at the University of Naples had to come to grips with the widest variety of philosophical views—Moslem and Jewish as well as Christian—before he developed his own philosophy, one of the most powerful syntheses of philosophical principles with theology in the history of the Church.

Today's Christian student is once again faced with the need to synthesize. The University's Department of Philosophy is attempting to meet this challenge by giving its students as wide a background as possible in the great philosophies of past and present so that each might have the materials at hand for bringing together philosophical thinking and his own Christian belief. A variety of contemporary approaches to philosophy are authentically represented among the teachers themselves, whose dialogue with one another is (hopefully) paralleled by a dialogue within the minds of those they teach.

Notre Dame is unusual among American Catholic universities by virtue of the stress it puts on the critical and empirical philosophical views current in secular schools of the US. Father McMullin, himself an expert in the philosophy of science, views analytic philosophy (as this logical-empirical approach is called) as an increasingly important tool in the discussion of all areas of intellectual concern. But because it stresses method rather than content—and the methods of empirical science in particular—it appears much less open to the values and problems of Christian faith than do many other contemporary philosophies. Yet not only can it bring a contribution of its own to Christian philosophizing, believes Father McMullin, it is vital to the survival of the Christian university—and ultimately of Christian faith itself—in a world of science.

On the graduate level Notre Dame's philosophy department has also taken great strides. "Five years ago only a handful of PhD's from Catholic universities were teaching philosophy in secular schools throughout the entire US. This year most of our doctoral candidates will seek, and many will find, places in these schools." Father McMullin credits this to the fact that Notre Dame provides a wider range of philosophical courses today than do a majority of the secular graduate schools in philosophy in the US or in Europe. "But Notre Dame's greatest challenge is to educate not only competent philosophers and good teachers, but men who are capable of facing the intellectual problems of their Christian faith as well," concludes Father McMullin. A 1954 PhD graduate of the University of Louvain, he is currently president of the American Catholic Philosophical Association.

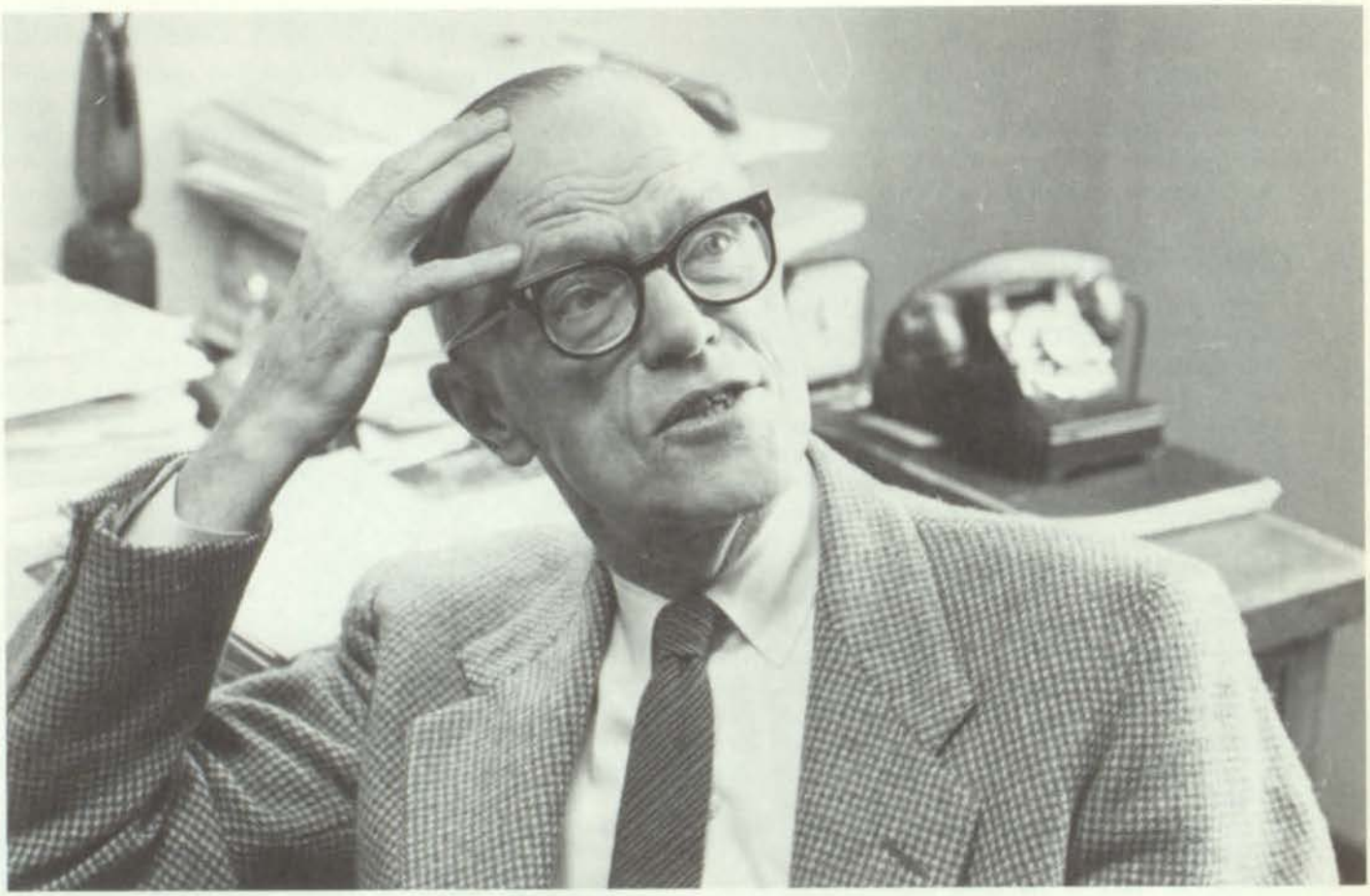
## O. Timothy O'Meara

"Many think mathematics is just solving problems. To be a mathematician one has to have original ideas." Dr. O. Timothy O'Meara, professor of mathematics and director of the department's graduate studies in mathematics, is a man of such ideas.

At Notre Dame the emphasis is on "pure" math—the math of ideas. In a field in which the solving of problems is motivated solely by an interest in the truth and properties of the math involved, the South African-born and educated teacher is a leader. He regards his subject as both science and art: one is stimulated, as in art, by the desire to satiate his own intellectual curiosity, but the results, as in science, reveal a unifying principle about the universe. Because pure mathematics does not work toward the end of application, Dr. O'Meara believes that mathematicians must work individually to develop ideas that are both interesting and important to the mathematical community. This does not, in his view, call for isolation. Rather, mathematicians ought to work in contact with one another through an informal interrelationship which fosters stimulation of thought.

He defines the roles of the math teacher in much the same terms. The teacher must be free to engage in his own research, yet work in close contact with the student to stimulate the student's interest and pursuit of original ideas. As director of the graduate studies in mathematics, Prof. O'Meara is concerned with the development of a program that will provide a good two-year foundation in each of the basic areas of math, followed by an opportunity for the student to develop his research potential under the guidance of a faculty member. Dr. O'Meara believes that such a program will bring graduate studies up to a par with the present Notre Dame undergraduate program which now ranks among the strongest in the nation.

Prof. O'Meara served as head of the department during the 1965-66 academic year under a rotating headship that enables the teachers to return to their teaching duties and research after a term as chairman. Currently, he is engaged in a National Science Foundation supported study of the arithmetic theory of classical groups. A graduate of the University of Cape Town, South Africa, he received his PhD from Princeton University. Subsequently, he was a member of the Princeton faculty and, also, a member of the famed Institute for Advanced Study there. Arriving at Notre Dame in 1962, Dr. O'Meara is the author of a book, *Introduction to Quadratic Forms*, a volume in the mathematical series *Die Grundlehren der mathematishcen Wissenschaften*.



**Edward F. Barrett** A lawyer with a vivid imagination, a fine sense of humor and a firm belief in the value of trial law is Edward F. Barrett, Law School professor. A seasoned attorney, he practiced law in New York State for 13 years before coming to Notre Dame in 1948. One of his major assignments upon his arrival at the University was the creation of a "practice court". Designed to acquaint students with actual courtroom procedures, Notre Dame's somewhat unique practice court has been in session for 14 years. Although numerous schools throughout the country provide various degrees of practical court experience, Notre Dame alone requires each third-year student to try a complete jury case in an actual courtroom.

Believing that the atmosphere of a courtroom would add a degree of realism impossible to achieve in a classroom, Prof. Barrett now has arranged for the use of four courtrooms in the Superior and Federal Courts of South Bend. Under the program he established, each third-year law student is assigned a case and the names of a client and supporting witnesses. These persons—all volunteers from the area and very often close friends of Prof. Barrett—are strangers to the students, thereby adding a facet of realism to the attorney-client relationship. The cases which are used in the practice court are formulated by Prof. Barrett during the summers. "I get the material from old records, transcripts of court testimony and my own fevered imagination."

Students work in pairs on both the prosecution and defense of each case and are expected to interview their client, formulate their case and argue it before the bench during their day-long trial. Law School Alumni, who sit on the bench in Indiana and Illinois courts, preside over the students' cases. "The practice court comes very close to what the students will be doing in another year or so if they're in this kind of work," he believes, "and very often it points out to them whether or not they have the aptitude for trial work. I've had several students who had no idea of the type work they wanted to do. In practice court they found themselves." A strong supporter of the adversary system of trial, Prof. Barrett also stresses the ethics of advocacy and insists that "every student be given a copy of the Code of *Trial Conduct of the American College of Trial Lawyers* before he goes into practice court." A member of the Bar in New York State, Prof. Barrett received his LL.B from the University of Buffalo and his doctor of juridical science from New York University.

*It has been said that academic freedom brings both controversy and difficulty to the university community, especially in its relationship to the outside world which likes to see everything neat and orderly. However, the president of any great university, when faced with a decision affecting peace or progress, will always opt for progress. This is as it should be. The university is a community committed to truth and constantly searching for the best way in which truth might be expressed to every new generation.*

Rev. Theodore M. Hesburgh CSC
President

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# Insight

**IN THE NEXT ISSUE**

A century and a quarter since its founding, Notre Dame today is the picture of a continually growing university community. In 125 years the expansion of Notre Dame's student enrollment, campus facilities and financial development has been nothing less than phenomenal. But, even more important, growth in recent years at the University has been measured with increased emphasis on the excellence of its educational programs, research endeavors and public services.

Inevitably, certain changes accompany the physical and intellectual growth of any academic community. Notre Dame is no exception. It too has changed to meet the challenges confronting education in the modern world.

In a special SUMMER issue, **INSIGHT: Notre Dame** will expand its regular 24-page format to explore the effects of these times on today's University. Look for your specially bound anniversary issue of **INSIGHT** in June with its exclusive profile of Notre Dame.