Professor strives for safer aircraft design through revolutionary engineering technique

On Aug. 12, 1985, Japan Air Lines Flight 123 slammed headlong into a mountainside northwest of Tokyo, killing all but four of the 524 passengers on board. Preliminary investigations indicate that failure of a structural component caused the accident.

On Oct. 11, 1985, McDonnell Douglas Corp. announced that cracks could develop in bulkheads connecting the wings to the fuselage of its newest fighter aircraft, the F-18. Experts blame an engineering defect.

Modern aircraft are as vulnerable as they are incredibly sophisticated. Failure of a single structural element can cause disaster. Yet the methods engineers use to evaluate structural components in aircraft are based on concepts pioneered almost 30 years ago.

Until recently, these methods represented the best available technology, says Bara Szabo, Ph.D., director of WU's Center for Computational Mechanics. But a significant breakthrough in computer-aided design techniques will radically alter the way engineers evaluate aircraft designs of the future, he says.

During the last 15 years, Szabo has developed PROBE, an engineering program he believes will result in more efficient engineering and safer aircraft for the 1990s.

In a test problem of an L-shaped corner, for example, he explains, "conventional technology must solve about seven million equations to reach a solution accurate to within one percent relative error. PROBE can do it with 800 equations. If it takes PROBE just one minute to solve this problem, then conventional programs would need 200 years on the same computer."

Or course no one has 200 years to solve a problem. Instead, engineers settle for lower-quality solutions. "The result," Szabo continues, "is that engineers spend more time and effort, more resources, and use more expensive computers to design a final product that ends up more expensive and more difficult to maintain."

Using the finite element technique, engineers calculate stress distribution on a physical object by dividing the object into a screen-like mesh of small sections called finite elements. Each element is mathematically modeled with approximating functions to represent stresses in the object.

To increase precision, conventional meshes often contain thousands of tiny elements. Because each element requires complicated processing, solution of a complex problem calls for substantial computer resources. Engineers spend about 80 percent of their time producing intricate mesh designs and interpreting vast amounts of data, says Szabo.

As an alternative, Szabo increased the mathematical sophistication of the approximating functions describing each element. As a result, he needed far fewer elements to accurately model the entire object. At first they said it could never work," he smiles. "As little as five years ago, critics hinted that Szabo's theories were nothing more than computerized black magic."

But in scientific papers published in 1981 and again in 1984, Szabo and Iva Babuska, an internationally recognized mathematician at the University of Maryland, provided rigorous mathematical proof that not only does PROBE perform better than existing technology, but if applied in a certain way will approach the theoretical optimum performance achievable. In other words, Szabo observes, "if a supreme being were to design a finite element program, it..."
Bountiful harvest: On a recent Saturday morning, 45 WU students harvested more than 200 bushels of turnips and mustard greens that were given away later that day to needy people in north St. Louis. The students, who are involved in the Inter-Varsity Christian Fellowship, had heard a talk on local hunger and decided to do what they could to help alleviate the problem. A farmer in West County volunteered his crop, which covered an area about the size of a football field. Otis Woodard, who distributes food, clothing and money to the needy through the Lutheran Family and Children’s Services, handled the distribution of the harvest from a truck outside his home. Among the turnip and mustard green pickers were (above, from left) Tim Williams, a sophomore in engineering; Adam Smith, a master’s degree candidate in civil engineering; and Ian Brockie, a doctoral candidate in chemistry.

Law library essential to legal scholars

Janis R. Powell, a second-year WU law student, is a husband and father of two-and-a-half-year-old Ben. "There are two ways to get good grades: be a genius or work very hard. To play it safe, I work very hard." In addition to his library studies, he hits the books at home for two hours each weekday.

The law library is popular for several reasons, according to McCloskey. It’s convenient; students can obtain input from their peers on complex law issues; and, of course, the library has “many resources that are extremely useful” to students, faculty and the St. Louis area law community.

The site boasts a large research collection of more than 310,000 volumes. It has source materials to help scholars find anything from specific law cases to statistics that support arguments.

The library also has opinions of various federal and state courts, briefs from the U.S. and Missouri Supreme Courts; numerous federal and Missouri statutes and regulations; law review articles; and legal treatises, which are comprehensive summaries of the law. Freund library is one of the few academic facilities nationwide that contains all of the administrative agency codes and regulations for the 50 states.

To help library users with their inquiries, Peggy McDermott, assistant law librarian for reference services, teaches students and faculty how to use the computer-based Lexis and Westlaw legal research systems. By using these online data bases, operators rapidly can find cases by plugging particular words, phrases or legal citations into the computer. In addition, they can retrieve administrative decisions made by federal agencies and examine cases heard by specific judges.

The Lexis and Westlaw data bases are part of a new revolution in processing legal information. Although WU’s law library still has traditional law books on most of its shelves, technology increasingly is being emphasized to quickly provide resources to researchers, says Bertrand Reams Jr., J.D., Ph.D., professor of law and director of the law library.

In the future, predicts Reams, the majority of legal information will be transmitted through laser or optical disks, which store massive amounts of information on a disk as wide as a 12-inch phonograph record. Reams recently purchased the library’s first optical disk unit, which indexes legal periodicals. He and his staff are considering acquiring another laser disk system that indexes federal government publications.

In another use of technology, the acquisitions department has completed a book catalog of the library’s monographs collected during the last five years by using a specific computer program to compile the information.

"We are anticipating future trends," Reams remarks. "Today we rely on microforms to store masses of legal information, tomorrow it will be the laser disk."

Kirby receives first Grimm traveling fellowship

William C. Kirby, Ph.D., assistant professor of history and director of the International Affairs Program, has received the first Roland Grimm Traveling Fellowship from the University. Grimm, a 1914 alumnus of the University, died in 1985. The fellowship was established to support WU faculty research in Asia. Grimm, who was 89 when he died, was a sales representative in the Orient for about 40 years. The University also is naming squash, handball and racquetball courts in the new athletic complex in his memory.

Kirby said the grant will support his research in Chinese archives for a book titled The International Development of China Since 1928. He is focusing on patterns of Chinese foreign economic and technical cooperation under both nationalist and Communist rule. He started the research in 1979 under a fellowship in Chinese studies from the American Council of Learned Societies.

The author of Germany and Republican China (Stanford University Press, 1984), Kirby joined the WU faculty in 1980 as director of the International Affairs Program in University College since 1985, he coordinates an interdisciplinary curriculum for students who travel and do business abroad.

During the past eight years, he has been a visiting research associate at the modern history institutes of the Chinese Academy of Social Sciences in Beijing and the Academia Sinica in Taipei.

Kirby earned his bachelor’s degree in history, summa cum laude, from Dartmouth College in 1972. After a year of graduate studies in history and political science at the Freie Universität in Berlin, he completed his Ph.D. in history in 1977 and doctorate in 1981 in history at Harvard University. He was a teaching fellow at Harvard from 1975 to 1979.
Chave got the good news Aug. 1, just three days before his wedding. "I was glad to receive the results before the big day," he says. "Between the wedding and moving, it might have taken a long time for the announcement to catch up with me."

In addition to the cash prize, Chave will gain some other benefits from his success. Not the least of which, he says, is a professional quality recording of his work, a must for a composer.

"Many prestigious schools have so many students, it's impossible to get the individual training a musician needs," he says. "WU's music department has a fine reputation and a small enough class that all students get individual attention."

Chave's compositions contrast greatly with much contemporary, "minimalist" music, which he says is repetitive and lacks movement. "Music should be forward-going," he says. "It should have a drive and a direction."

Chave's own direction, after he receives his doctoral degree in the spring, is also forward-going. He hopes to find a teaching position in an urban area and continue writing music. "I'm hoping to find a publisher for his trio. "Having won this competition won't hurt at all," says the composer.

\[ Continued from p. 1 \]

\section*{Aircraft safety}

\section*{continued from p. 1}

could perform a little better than PROBE. But not much."

PROBE's rigorous mathematical foundation allows it to tackle problems that have eluded conventional technology, making it attractive to the aerospace industry, a critical user of finite element technology.

"We have created a tool that lets engineers do more creative engineering," proclaims James A. Flowers, president of Nutec Technologies, the company formed to develop and market PROBE. "The bonus is that the answers are better. Not only will it tell you the answer, but it is the only program in existence that is able to tell you how good the answer is," says Flowers.

Szabo believes that new designs will be measured with the aid of the powerful engineering tool. Doubtlessly, PROBE will have significant impact on the performance and safety of aerospace structures.

\section*{Robert Brock}

\section*{Edison has Dickens' \textit{Great Expectations}}

Edison Theatre will present the Guthrie Theater performing "Great Expectations" at 8 p.m. Friday, Dec. 13.

Barbara Fields adapted Charles Dickens' story for the company's 1985-86 tour. "Great Expectations" is set within the squalor and turbulence of Victorian England. It tells the story of Pip, an orphan, and his journey from rags to riches. Along the way, he encounters a starving convict, Abel Magwitch; a bitter spinster, Miss Havisham; her beautiful but cruel daughter, Estella, who spurns Pip's love; and assorted other characters who influence him.

When a mysterious benefactor offers to pay Pip's way to gentrification, he travels to London in hopes of becoming a gentleman and winning Estella's love. He is trained in society manners by Herbert Pocket, a London dandy. In the end, the mysterious benefactor is revealed and Pip comes to terms with himself and Estella.

The Guthrie Theater, now in its 23rd season, is one of the nation's foremost regional theaters. Since 1980, the Guthrie has been under the artistic direction of Liviu Ciulei, Romanian stage and screen director, actor, designer and architect.

Ciulei has an international reputation as an adventurous director. He made his U.S. directorial debut in 1974 with the American premiere of George Buchner's "Leonce and Lena." His European credits include "As You Like It" in Romania and West Germany and "Leonce and Lena" in Romania and Scotland. At the Guthrie, he has staged "The Tempest," "As You Like It," "Twelfth Night," "The Three Sisters," "Eve of Retirement," "The Threepenny Opera," "Requiem for a Nun" and the critically acclaimed "Peer Gynt."

In recognition of its outstanding contribution to American theater, the Guthrie was presented the Tony Award in 1983 by the American Theater Wing and the League of New York Theaters and Producers. The award was recommended by the American Theater Critics Association.

Tickets for the performance are $15 to the general public, $10 to WU faculty and staff and senior citizens and $7 to students. For tickets, call the box office at 889-6543.

This program is made possible by support from the IBM Corporation, the Missouri Arts Council and the National Endowment for the Arts, through their participation in Mid-America Arts Alliance, a regional arts organization.

\section*{Intramural office holds racquetball tournament}

The WU Intramural Office of the Athletic Complex is sponsoring a continuing racquetball tournament for faculty and staff. The tournament format will be ladder-type competition, with players challenging higher-ranked opponents to obtain their positions on the ladder.

Players of all skill levels are encouraged to enter this ongoing tournament and entries will be taken at any time (no entry deadline) in the intramural office. Complete tournament rules also are available in the office. For more information, call 889-5193.
Physical therapist gives warning on 'feeling the burn'

Sahrmann warns that particular exercises may be inappropriate for certain body types, weights and ages. An avid believer in the benefits of exercise, she deplores the intensity and inherent imbalance in many popular calisthenics-type exercise regimens.

"Counterbalancing exercises are necessary because the body operates according to the laws of physiology," she says. "Every action of movement is accomplished by certain muscle groups contracting while other muscle groups relax. These opposing actions make movement possible. But if the muscles that contract during a certain movement become over-tightened (too short) from overuse, problems arise, most commonly pain and discomfort in the opposite direction."

"For example, you can countercurrent sit-ups by standing against a wall with head and shoulders back, arms extended overhead. Other exercises should also be done lying face down to strengthen back and hip muscles."

Sahrmann didn't set out to make eyes roll, but she insists that not the best way to strengthen a sagging abdomen. "The abdomen is encased in layers of muscles. To stop sag, the broad sheets that comprise one of the outermost muscle layers — the external obliques — should be strengthened. (The external obliques are sometimes called the 'lower abdominals' according to exercise aficionados.)" But instead of engaging the lower abdominals, sit-ups strengthen and shorten an inner muscle — the internal oblique — and the outermost, ribbon-like layer of muscle — the rectus abdominis, too short. And it neglects the lower abdominals, while over-emphasizing the rectus abdominis."

"Sahrmann warns that particular exercises may be inappropriate for certain body types, weights and ages. An avid believer in the benefits of exercise, she deplores the intensity and inherent imbalance in many popular calisthenics-type exercise regimens."

-- Shirly Sahrmann, Ph.D., WU neurobiologist and physical therapist, instructs runner Jennifer Strifer on how to properly perform lower abdominal exercises.

Get physical with these risk-reduced exercise tips

To make strenuous exercise easier, Sahrmann has some tips to share. First, consult an exercise physiologist or physical therapist to evaluate your posture for any inherent weaknesses and to help you avoid exercises that would aggravate them. You'll be tested for spinal alignment, shoulder girdle function, and hyperextended knees.

"Once you know what postural quirks you have, you'll want to structure your exercise regimen accordingly. For example, resistive-type exercises (weights) to strengthen the shoulder girdle can cause problems, especially for women. 'It's very difficult for a woman to do these safely,' advises Sahrmann. 'They have to be careful not to put their shoulders forward. And they should start off with light weights, increasing resistance very slowly.'"

Persons with forward-pointing shoulders should avoid any exercises involving a lot of forward arm swinging or swimming. Instead, so that head, knees and ankles are extended from the center of the pelvis to the abdomen.

"Most body-conscious people, however, don't know physiology. They undertake a self-prescribed program of more sit-ups to remedy the problem of a protruding abdomen. Sit-ups also tend to pull the head forward and press the upper spine into faulty alignment, creating neck problems and a forward-thrusting head — which most people try to have already," says Sahrmann. Doing sit-ups from a shortened position is also a problem: "This tends to depress the chest by making the abdominal muscles work for the rectus abdominis, too short. And it neglects the lower abdominals, while over-emphasizing the rectus abdominis."

"It's true that the buoyancy of water can help alleviate some of the shock delivered to joints. But to assume that you will adequately strengthen your lower back by doing this full-body exercise in water is not true. Swimming may keep you from getting back problems, but it doesn't correct existing ones."

"I think it's wonderful that people are trying to exercise," continues Sahrmann. "To be healthy, they need to. For women, preliminary studies are showing that exercise helps prevent osteoporosis, or brittle bones. But people have to get to the point where they can tolerate strenuous exercise.

Shirley Sahrmann, Ph.D., WU neurobiologist and physical therapist, instructs runner Jennifer Strifer on how to properly perform lower abdominal exercises.

Other doctors told Linda that her problem was weak abdominals. Strengthen them with sit-ups, they recommended. Not satisfied, Linda, who assumed Sahrmann did Linda learn that her 'good sit-ups' (trunk curls) were having some bad effects.

"Linda has forward shoulders and a depressed chest," says Sahrmann. "The rectus abdominis is shortened from too many trunk curls, and sit-ups have pulled her chest down and head forward. Her lower abdominal muscles are not as well developed as they should be because the rectus is so strong."
Local diabetics needed for national study

WU School of Medicine is seeking people with insulin-dependent diabetes to participate in one of the largest and most important studies of the disease ever performed on medical education.

Volunteers are needed for the Diabetes Control and Complications Trial (DCCT), a seven-year study that will include 1,100-1,200 participants. WU is one of 21 medical centers across North America helping to conduct the research, funded by the National Institute of Arthritis, Diabetes and Digestive and Kidney Diseases, part of the National Institutes of Health.

The DCCT is designed to answer one of the most important remaining questions about diabetes: how effective are some of the newer forms of diabetes therapy at preventing, delaying or reversing the presence of diabetic complications? These complications may affect the eyes, kidney, nerves, heart and blood vessels.

"Even in people who control their diabetes, the complications can cause serious health problems," says Julio Santiago, M.D., one of the local study directors. "The relationship between blood sugar control and diabetic complications is an extremely important issue: The outcome of the DCCT will have a major impact on the treatment of diabetes in the future."

Bedell honored by dental alumni association

Robert E. Bedell, D.D.S., has received the 1985 Distinguished Alumnus Award from the WU Dental Alumni Association. The award was presented to Bedell, a Kirkwood orthodontist, at a recent banquet concluding the 119th annual meeting of the association. He was chosen as recipient of the award by an anonymous committee of his fellow dental alumni.

Bedell received his dental degree from WU in 1944 and the master of science degree in orthodontics in 1951. He was honored for his long service to the School of Dental Medicine as teacher, alumni leader and fundraiser, and for his prominence in national and regional orthodontic activities.

Bedell taught at the School of Dental Medicine from 1944-51 and from 1958-82. He is a longtime member of the Dental Alumni Association board of directors and served as president of the association in 1978. A member of WU's William Greenleaf Elliott Society since 1970, he has helped seek contributions to the School of Dental Medicine and presently serves on the School's Capital Resources Committee.

In 1979, Bedell was the recipient of the Distinguished Service Scroll of the American Association of Orthodontists (AAO). He has held various offices with the AAO, the Greater St. Louis Dental Society and the Missouri Dental Association. He served as president of the Midwestern Society of Orthodontists in 1983-84 and continues as a member of the society's board of directors. He has served for many years on the association board of directors. He has served for many years on the Missouri School for the Blind.
Medical school seeks volunteers for several cholest erol studies

Researchers at WU School of Medicine are seeking volunteers to participate in several studies on the effects of diet and medication on blood cholesterol. The studies will be conducted by the Lipid Research Center, which spent 10 years as part of an unprecedented national study that proved lowered blood cholesterol levels can reduce the risk of heart disease. The center, along with 11 other research centers, in January 1984 released results of the Coronary Primary Prevention Trial, sponsored by the National Institutes of Health (NIH).

Researchers at the School of Medicine are using the findings of that 10-year project as the foundation for further studies of the relationship between cholesterol and heart disease. The work will be directed, before, by Gustav Schönfeld, M.D., director of the Lipid Research Center and acting head of the Department of Preventive Medicine and Public Health, and by Anne Carol Goldberg, M.D., instructor in preventive medicine and medical informatics.

The center is now screening volunteers for the studies, which will last five months. Participants will receive complete physicals, including lab tests, free of charge and will follow a low-fat diet.

Among the projects is a diet study funded under a three-year, $110,000 grant from the NIH. According to Schönfeld, an inherited protein defect that affects 25 percent of Americans is believed to render them more susceptible to cholesterol, and thus at a higher risk of cardiovascular disease.

This is the first study of its kind to examine the effect of diet on cholesterol levels. Also, participants will be asked to have a spinal tap at the beginning and end of the trial. All testing will be conducted at the Clinical Research Center at the School of Medicine.

Two other studies will test new cholesterol-lowering drugs, one in liquid form and the other in capsule form. Researchers will use volunteers aged 21-70 to test for optimum dosage and long-term tolerance.
Robert Blackburn, director of Community and Government Relations, was presented the annual Communication and Leadership Award at the Fall Conference of District 8 Toastmasters International.

John M. Fredrickson, M.D., chairman of the Department of Otolaryngology, was elected treasurer of the American Laryngological Society.

John Garganigo, Ph.D., professor of romance languages, has just completed four papers on Latin American literature at the annual conference of the Midwest Association of North Americanists. He is on a two-month lecture trip in Lima, Peru, Buenos Aires, Argentina, and Montevideo, Uruguay.

Stephen H. Legomsky, a professor of English at the University of Missouri-Columbia in Columbia, Missouri, has just published his working title. The book will be published by Oxford University Press.

Yvonne Captain-Hidalgo, Ph.D., professor of Spanish, delivered a paper titled “Belief, an Evolving Concept” at the XXII General Manuel Zapata Olivella at the annual Conference of the Midwest Association of North Americanists. Her presentation of her paper was “Significant in the Works of Manuel Zapata Olivella.”

James G. Miller, Ph.D., professor of physics and research associate professor of medicine, recently presented an invited paper, “Ultra-sonic Characterization of Myo-cardium,” at the Sixth Symposium on Echo-cardiography in Berlin, The Netherlands. This research, which represents a collaborative effort with colleagues, was invited to present this work to the American Society for Ultrasound in Medicine.

David W. McDonald, Ph.D., professor of history, spoke on English Puritanism during a recent workshop at the John S. and Catherine Ford Department of Medical Sciences at the Washington University School of Medicine.

Ruth E. McDaniel, M.D., assistant professor of otolaryngology, was selected KEZK’s professor of technology management for her “outstanding achievements as a leader in the field of technology management.”

Fordham College of St. Louis on “China: Potholes and Prospects” will address the World Affairs Council during Alcohol Awareness Week, Oct. 21-25. Her presentation was “Out of the Bottle — Women’s Recovery from Addiction.”

Robert Permuter, manager of WU’s Real Estate Properties Department, has been reappointed to serve on three national level committees of the National Institute of Real Estate Management for 1986. The committees are accredited resident manager standards, asset management and continuing and general education.

Mark R. Rank, Ph.D., assistant professor of sociology, presented a paper, titled “Length of Welfare Use Among the Elderly: A Test of Race Versus Opportunity,” at the National Council on Family Relations annual meeting, held Nov. 6-9 in Dallas.

Martha Storandt, Ph.D., professor of psychology and neuropsychology, was an invited speaker at a recent workshop on Early Diagnosis in Alzheimer’s Disease, sponsored by the Leona M. and Harry B. Helmsley Trust. The workshop was held at the University of Florida College of Medicine in Gainesville.

J. Regan Thomas, M.D., assistant professor of otolaryngology, was elected vice president of the American Academy of Facial Plastic and Reconstructive Surgeons. Thomas will oversee the fellowship programs, educational activities and workshops and scientific programs of the association.

Have you done something noteworthy?

Have you presented a paper? Won an award? Become a member of a professional organization?

The Washington University Record will help spread the good news. Contributions regarding faculty and staff scholarly or professional activity that are generally accepted and recognized. Send a brief note with your name, highest-attained title, affiliation, and date, along with a description of your noteworthy activity to Natives, Campus Box 1075. Please include a phone number where you can be reached.

Ruth E. McDaniel, Ph.D., affiliate professor of technology management in the Department of Engineering and Policy, has been named the representative from the School of Engineering and Applied Science to the planning committee for the National Innovation Workshop, to be held in St. Louis in November. McDonald also has been appointed to the editorial board of The Business Deans Review, a journal sponsored by the Commercial Development Association.

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Boccia exhibits paintings at three institutions

"My eyes are always on the masters and not on fashion — ever," says Edward E. Boccia, assistant professor of art and archaeology. "I'm not interested in fads or what's hot in galleries, but I've always been moved by the masters."

The influences of the masters — painters from the Italian Renaissance, Expressionism, Cubism and Surrealism — on Boccia's work are evident. Boccia's paintings appear in a major exhibition of his work, "The Trip-tychs," to be held at three higher educational institutions in St. Louis.

A triptych is a picture or carving on three side-by-side panels, often used as an altarpiece, with a central panel and two flanking panels (half its size) folding over it.

Oil on canvas triptychs will be exhibited from Dec. 8 to Jan. 5 in the Gallery of Art in Steinberg Hall and St. Louis University Medical Center's Learning Resources Center. Margaret McCormick Daisy Bldg., 5341 Caroline. Related sketches and drawings of the triptychs were exhibited Dec. 1 to 21 in the Fontbonne College Library Gallery.

Boccia will present a slide lecture on his triptychs at 4:15 p.m. Tuesday, Dec. 10, in WU's Steinberg Auditorium in Steinberg Hall. He is featured at 7:30 p.m. Wednesday, Dec. 4, on KETC-TV Channel 9's program, "St. Louis Skyline." Sherrey Cohn, Ph.D., visiting assistant professor of art and archaeology at WU, has written an essay on the artist for the exhibit's illustrated catalog.

Nasa honors Arvidson for service

Raymond E. Arvidson, Ph.D., professor of psychology and planet science, will receive a NASA Public Service Medal in an awards ceremony on Dec. 5 at the Jet Propulsion Laboratory in Pasadena, Calif. Arvidson is being honored for his leadership role as chairman of the National Academy of Science Committee on Data Management and Computation and for his contributions as a member of numerous other NASA advisory groups dealing with the problems of space data management.

The Public Service Medal is one of 18 awards presented by NASA during 1985. It is given annually to a scientist from a private institution for exceptional contributions to NASA's space program.

Society of Physics Students honored

The WU chapter of the Society of Physics Students (SPS) has been designated one of the nation's "Outstanding SPS Chapters for 1984-85" by the National Society of Physics Students, a branch of the American Institute of Physics. Only 30 of the nation's nearly 300 chapters nationwide have received the honor.

Patrick C. Gibbons, Ph.D., associate professor of physics, is the advisor for the WU chapter, and Richard E. Norberg, Ph.D., is the chairman of the physics department.

The award was established in 1978 to give recognition for outstanding work in the promotion of physics. Selection of the outstanding chapters is based on activities and lectures, improved membership project, student projects presented at scientific meetings and physics awards granted to member students.
Thursday, Dec. 5
4 p.m. Central Institute for the Deaf Research Seminar, Clinical Performance of a Digital Hearing Aid. Gerald Popelka, clinical research scientist, A. Maynard Engebretson, visiting professor; Robert Mayotte, research associate; Arthur Niemierko, associate research scientist, General Electric Hearing, design engineer. 2nd fl. aud. Clinics and Research Bldg. 659 South Taylor Ave.
4 p.m. American Medical Student Association Lecture, "Aspiration, Apollo and Zeus: Health, Community and Government." Victor W. Sidel, Distinguished University Professor of Social Medicine and Monte Medical Center, Albert Einstein College of Medicine. Also sponsored by the Department of Preventive Medicine and Social Medicine, Montefiore Medical Center.
4 p.m. Dept. of Chemistry Seminar, "Evolu-...