Deep in winter, while armchair botanists order seed for their spring gardens, Washington University biologist Karel Schubert searches the wild, lush rain forests of Costa Rica for plants of antiquity that will bear seeds of the future.

Karel Schubert, Ph.D., assistant director of the Center for Plant Sciences and Biotechnology at the University, is one of a handful of scientists in the world looking for tropical plants that naturally repel insects. He collects specimens from the Organization for Tropical Studies Biological Station at La Selva, a multi-institutional preserve established by a group of international universities and Costa Rican scientists. The 90,000-acre area, starting at 260 feet above sea level and rising to more than 6,000 feet, comprises approximately one-fourth of the virgin forest in the country, which elsewhere is badly deforested.

Schubert and his collaborators plan to incorporate beneficial genes from these plants into agricultural crops such as corn, soybeans, wheat, and cotton, to make more self-sufficient plants that will not require costly and environmentally damaging insecticides. His efforts are part of a biotechnological trend that seeks to use global agriculture, nature and protect dwindling biological plant species and refurbish degraded Third World countries. A more practical search may even yield important chemicals that could be developed into drugs to treat diseases such as AIDS and cancer.

"Costa Rica is one of the richest environments for plants and animals in the world, with a wealth of diversity," says Schubert. "We're using this diversity to seek out proteins that we can engineer into plants to develop better crops -- for both American and third world agriculture. These genetic resources, which are disappearing rapidly in many parts of the world, must be preserved and used scientifically to their best benefits before time runs out. Tropical forests contain half of all the plant and animal species on the planet. Yet in Costa Rica alone, 120,000 acres of forest are disappearing each year."

Species extinction in tropical countries, spurred by massive deforestation, is occurring at break-neck speed, says Peter Raven, Ph.D., Engelmann Professor of Botany at Washington University and director of the Missouri Botanical Garden.

"Each year an area nearly the size of West Virginia, some 20,000 square miles of forests, is being har vested for timber in tropical forests," says Raven. "If this rate of clear-cutting continues, the world's tropical forests may be gone in 60 years. Lost with this habitat will be countless species of organisms that can aid humanity in many different ways."

Nature's insecticides

Schubert's work is funded with a grant from the newly formed Midwest Plant Biotechnology Consortium at Purdue University, the nation's first biotechnology consortium involving government, universities and industry. The primary emphasis in his research is on agricultural applications for tropical plant species. He is working in cooperation with entomologists at the University of Missouri-Columbia, the U.S. Department of Agriculture, Biocontrol Laboratory and Costa Rican scientists. He also will draw upon the resources at the Missouri Botanical Garden, which contains 3.5 million specimens of plant life.

"Tropical plants are a storehouse of naturally occurring insecticidal compounds," says Schubert. "We plan to study these plants to identify and isolate proteins with selective activities -- that is, activities detrimental to targeted insects only -- against insects that damage economically important plants."

Worldwide, about 15 percent of agricultural crops are lost each year to damage caused by the nearly 100,000 known insect species. To protect crops and increase yields, growers throughout the world invest billions of dollars in pesticides, fertilizers, herbicides, fungicides and growth regulators. The World Health Organization estimates that 500,000 human poisonings and 20,000 deaths occur worldwide each year from the use of these chemicals, which seep into groundwater, soil and the food supply itself.

Fieldwork

In his Costa Rican wanderings, Schubert keeps a wary eye out for the eyelash viper, a poisonous snake that lounge in trees and strikes humans, without warning, often at eyelash level; the 2-inch-long bulbs (Tulipa) that bites with the strength of a scorpion; and the bushmaster, an 8-foot-long snake that lurks on the forest floor and is capable of biting through the toughest of leather boots.

He looks for plants already described in scientific literature that exhibit insecticidal properties, such as certain legumes related to red bulbs and locusts, some of which rise 200 feet above the forest bed. He also observes which plants are being ravaged by insects, which are not.

"In observing tropical plants, you'll see scores of them devastated by insects, but others in the same area that are not affected," Schubert says. "In previous trips, for instance, I've noticed that certain seeds of the Amanthus family appear to be untouched. Most plant seeds don't have a chance to hit the ground because the many species of birds, monkeys, squirrels and insects eat them while they're still on the tree. Some of these seeds are the size of silver dollars and have a very hard shell, but most animals can crack a pretty hard seed. Survival of these seeds suggests they may contain proteins that are repellant."

He collects seeds, leaves, bark and sap. Capping an 18-hour day, he runs chemical assays at night in the La Selva laboratory to identify possible inhibitors of insect digestive enzymes, called proteases. These protease inhibitors have been proven to kill certain insects outright or make them sick or retard their growth.

"The proteinase inhibitors are one group of proteins we would like to introduce into crops, and we think the variety of these proteins is abundant in an ecologically diverse ecosystem such as Costa Rica," Schubert says. "The genetic material in the many plants is valuable agriculturally because the insects here have never seen it before."

Cornell University Professor of Neurobiology Thomas Eisner, Ph.D., says species are being lost throughout the world faster than rates of evolution.
Women’s basketball team finishes best season with 25-3 record

A nightmarish conclusion notwithstanding, the Washington University women’s basketball team enjoyed a dream-like season in 1989-90. Sparked by an infusion of youth and steered by a bright senior leadership, the Bears roared to a better-than-expected 25-3 record. Along the way, the Red and Green claimed a third-consecutive University Athletic Association championship. Owners of an unblemished 14-0 record in the highly competitive league, the Bears became the first basketball team in UAA history — male or female — to finish with an undefeated conference mark.

After completing the regular season at 25-1, the Bears were ranked third in the final National Collegiate Athletic Association Division III national poll, and achieved number-one status in the region.

The Red and Green earned a ticket to the NCAA Championship tournament by virtue of their UAA crown. It was the first season that the three-year-old league was awarded an automatic bid. Not only did the Bears get into the tournament for the second time in three years, but Washington was selected as host site and top-seed for the NCAA Central Regionals.

Carrying a school-record 18-game winning streak into postseason play, the Bears also boasted a four-year, 40-game home winning streak against Division III competition. Both streaks now sit at zero as the Bears were upset by fourth-seeded Buena Vista College, 78-71, in the opening round, and stung 54-52 by third-seeded Augustana College in the crossover game. Buena Vista advanced to the national quarterfinals by defeating second-seeded Wartburg College.

The Buena Vista-Washington game was reminiscent of a classic heavyweight boxing match. After both sides sparred for the first seven minutes, the Bears held a slight 14-12 advantage. From that point on, the two teams traded big shots. Buena Vista scored the big blows. Buena Vista struck first going on a 20-7 run, which was followed by a 23-4 Washington blitz. The Beavers then outscored the Bears 14-4, only to have the Red and Green rally back to force a 12-4 run. Buena Vista took off on an 11-2 tear, only to watch the Bears pick themselves off the mat one last time with a 9-2 stretch. The Bears had one last answer, though, reeling off a 7-2 run over the last two minutes.

The Bears returned the next night for an after-sparing consolation game against third-seeded Augustana. After coming strong out of the blocks, the Red and Green held a 24-13 lead with just 1.5 points remaining. However, Augustana outscored the Bears 35-13 over the next 18 minutes to end the 48-37 game with just five minutes remaining. The Bears finally snapped out of their doldrums, but a desperate 15-6 run fell two points short.

In the days that followed the two losses, a number of accolades have poured in, helping to save the Bears’ wounds. Senior Rochelle Meyers, Valparaiso, Ind.; junior Karen Hermann, Worthington, Ohio; sophomore Michele Lewis, Fresno, Calif., were named to the UAA’s All-Association first team. Additionally, Hermann and Meyers are candidates for the National Central Region honors, and Hermann earned second-team GTB ranking. For the second time in three seasons, head coach Nancy Fahey and assistant coach Bill Shapiro were voted by their peers as UAA coaching staff of the year. Fahey, 81-19 after four seasons as the Bears’ mentor, also was named NCAA Division III Central Region coach of the year.

Sights will be aimed high again next season as the Bears graduate two seniors. However, the contributions of Meyers and fellow co-captain Linda Blakemore of St. Louis, Mo. 63130.

Fielding a young and talented team, the Bears’ prognosis for next year is bright.

California-based architect to talk

California-based architect Peter Plu will give a free lecture titled “Build- ings, Words, Machines” at 8 p.m. April 4 in Steinberg Hall auditorium.

The lecture is part of the School of Architecture’s Monday Night Lecture Series and is co-sponsored by the Assembly Series.

For more information, call 889-6200.

New historicism is lecture topic

Stephen Greenblatt, The Class of 1932 Professor of English Literature at the University of California — Berkeley, will speak at 4:15 p.m. on Thursday, April 5, in Room 110. Greenblatt’s free and public lecture, titled "New Historicism and the Representation of Cultures," is part of the WU Department of English’s Shakespeare Month.

Greenblatt is the leading figure in a new approach to literature called “New Historicism,” which is a critical method that synthesizes recent work in literary theory, cultural anthropology, social history and textual study. A Shakespeare scholar, he has written three books, including the 1980 book *Remains of the Day: Shakespeare-Freud—From More to Less*.

For information, call 889-6620.
A memorial service will be held May 4 in Brown Hall Lounge for William E. Gordon, Ph.D., professor emeritus at the George Washington University School of Social Work. Gordon died Saturday, March 10, 1990, at his home in Lawrence, Kan., of chronic obstructive pulmonary disease. Trained as a biological scientist with an emphasis on ecology, he moved into public welfare in the early 1940s and then into social work education, becoming one of the first leaders in social work research. He was among the first scholars to introduce the ecological approach into social work thinking, believing that the central focus of social work should be the interaction between the person and the environment. After serving as a senior research consultant for the Social Science Research Council of Washington, D.C., and Minneapolis, Minn., he joined the Nashville School of Social Work, Vanderbilt University. In 1951 he was appointed professor of the University of Southern California School of Social Work in Los Angeles and associate professor of the nation's first doctoral programs in social work at Washington University. He retired from the University's social work school in 1978. Since 1980 he has been a member of the board of the International Research and Exchange Board. In addition, Beckerman was selected to be the academic adviser for a Smithsonian Institute study tour of Prague, Czechoslovakia, where he gave lectures on Czech history and culture, and met with members of a civic forum. Beckerman also is giving a series of lectures on Middle East futures in Brahman at association with this year's Chamber Music at St. Louis Concerts.

Michael Beckerman, Ph.D., associate professor of music, gave two presentations at the Olin College of Business weekend meeting held in St. Louis. He delivered a keynote lecture titled "Does St. Louis Have a Successful Wine and Spirits Sector?" and presented "Canons Everywhere as part of a panel discussion. Beckerman also gave a lecture titled "The Chang- ing Denizens of Arcadia" at the American Academy of Religion national meeting held in Austin, Texas, in January. Beckerman is a member of the program board of the International Research and Exchange Board. In addition, Beckerman was selected to be the academic adviser for a Smithsonian Institute study tour of Prague, Czechoslovakia, where he gave lectures on Czech history and culture, and met with members of a civic forum. Beckerman also is giving a series of lectures on Middle East futures in Brahman at association with this year's Chamber Music at St. Louis Concerts.

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professor emeritus of social work

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out at the edge of traumatic human experience. After a disaster, such as a hurricane or poison-gas leaks, earthquakes and hurricanes occur, the ability to cope often severely suffers. However, the lessons may be learned by studying people's reactions to catastrophes. Can these psychological effects on survivors be predicted and treated? And how is the extreme stress that undergoes the psychological state of the day vary?

Some questions and others are addressed by three recent studies conducted at the School of Medicine. Patterns are emerging, according to Elizabeth Smith, Ph.D., who interviewed subjects at the sites of both natural and man-made (or technological) disasters. "The evolving picture will help us understand the mechanisms we use to cope with stress."

In studies of three disasters, data show that people with previous psychiatric problems are the ones most likely to need help in coping with the consequences.

"Nothing we've found is perfectly predictive of psychiatric disorder after a disaster," warns Smith, chief psychiatrist Carol North, M.D. But statistics show that those with a previous diagnosis are most likely to have new psychiatric difficulties. "Resources are often severely strained in the wake of a disaster, so it's vital to identify the people who are most likely to need help and direct efforts toward them," North says. She cites Hurricane Hugo and the San Francisco earthquake as recent cases in point.

Because samples at individual disaster sites tend to be small, the researchers are reluctant to generalize too broadly from their preliminary results. However, beyond showing previous psychiatric illness as a predictor, early analyses seem to indicate that an individual's perception of a disaster is more likely to lead to depression than to anxiety. People who perceived more direct and damaging effects of a disaster, investigators hope their work will make events. "We may expect a disaster, and an "off-site" group who were at work and survived. Overall, Smith and North report, more than two-thirds of the post-disaster psychiatric disorders occurred in individuals who had prior psychiatric diagnoses.

After the northern Florida tornado of April 1988, rates of disorder were substantially lower, perhaps because horror was not a factor and many subjects reported that the event was over before they knew what was happening. Of 42 subjects interviewed, 37 had their homes demolished, but just two were injured badly enough to require hospitalization.

The five subjects met the strict criteria for a psychiatric diagnosis, but individual symptoms associated with PTSD were common, with more than a third of the total subjects suffering from at least one symptom.

Two of the five subjects diagnosed with PTSD had previous histories of psychiatric disorder. The authors urge further study of such a relatively well-defined group to "increase our understanding of effective coping strategies and allow us to identify the most helpful community resources."

Future studies will consider whether psychiatric treatment is of measurable value in cases of extreme stress, and then which of several modifications are most effective. "Right now, we're still defining risk factors and delineating the disorders," says North.

In the long term, Smith hopes the work will lead to a "more general understanding of the mechanisms we use to cope with stressful life events. How do we perceive them and how do we deal with them? We'd like to understand the process of coping," she says.

Elizabeth Smith, Ph.D. (right) and Carol North, M.D., traveled to the sites of disasters to assess how survivors are coping.

Medical Record

Study examined how we cope with catastrophe

Note: The studies quoted were funded by the National Science Foundation and the National Institutes of Mental Health through the Natural Hazards Research and Applications Information Center, University of Colorado-Boulder.
Repercussions of war

Posttraumatic stress disorder still prevalent in Vietnam vets

It's been nearly 15 years since the Vietnam War ended, but a new study shows that some veterans still have symptoms of posttraumatic stress disorder — recurring nightmares, mentally re-living the terror of combat, and the need to avoid situations that may trigger war memories.

The study, published March 2 in the Journal of the American Medical Association provides solid evidence that Vietnam veterans have substantially increased chances of experiencing symptoms of the disorder compared to veterans who didn't serve in Southeast Asia. Results also indicate that prevalence of the symptoms increases correspondingly with the extent of combat exposure.

Study authors include Seth Eisen M.D., clinical assistant professor of medicine at the School of Medicine, and William True, Ph.D., associate professor of health services, education and research at St. Louis University Medical Center. Eisen and True are affiliated with the St. Louis Veterans Affairs Medical Center. They conducted the study with Jack Goldberg, Ph.D., and William G. Henderson, Ph.D., of the VA Cooperative Studies Program in Hines, Ill.

Eisen noted that the development of posttraumatic stress disorder (PTSD) conclusively with military service. Vietnam veterans are more likely to experience painfull memories of military service, in high combat, approximately 35 percent developed PTSD.

Ongoing analyses, using additional data obtained from internal Vietnam era veteran twin pairs, will permit the contribution of inheritance to the development of PTSD to be estimated. That work is being done in conjunction with Department of Psychiatry researchers John Rice, Ph.D., Rosalind Neuman, Ph.D., and Andrew Heath, Ph.D.

Lefkowith named pharmacology scholar

James B. Lefkowith, M.D., assistant professor of medicine and pharmacology at the School of Medicine, has been named a 1990 Clinical Pharmacology Scholar by The Burroughs Wellcome Fund.

As a pharmacology scholar, Lefkowith will receive $300,000 over the next five years to conduct research on the molecular mechanisms involved in certain immunologic diseases.

The Burroughs Wellcome Fund, a private, non-profit foundation supported by Burroughs Wellcome Co. Pharmaceutical Research and Development, established the scholar awards program in 1986 to support the career development of clinical pharmacologists and to stimulate translational research in clinical pharmacology. Clinical pharmacologists play a vital role in understanding how drugs work in the human body, investigating new and better therapeutic agents, and teaching physicians how to prescribe drugs safely.

Lefkowith's research involves the study of fatty acid deprivation and its effect on the inflammatory response. About 10 years ago, it was found that essential fatty acid deprivation exerts a strikingly beneficial effect in an animal model of a human disease called systemic lupus erythematosus. This simple dietary manipulation prevents the lethal kidney disease that occurs in this disorder. Lefkowith's research is focused on understanding how the molecular mechanisms involved in this process work and how they can be pharmacologically manipulated. An eventual goal is to develop new strategies to deal with immunologic disease in patients, such as systemic lupus erythematosus, type 1 diabetes and tissue rejection.

Elaine Riegle, M.D., examine a patient during her first trip to Liberia in 1982.

Riegle spends months teaching in primitive West African hospital

Once a year pediatrician Elaine Riegle leaves the medical center's sophisticated technology behind and travels to a small hospital in West Africa where the beating of a patient's heart is measured by sound and touch.

She takes with her any medical texts she can, in addition to such items as outdated or open suture packets, catheters, IV tubing and sterile cloths. Though disposable materials here, they're in short supply. Liberia's Phebe Hospital can't afford and does without, says Riegle, an instructor in the department of anesthesiology at the School of Medicine and a physician at St. Louis Children's Hospital.

Since 1982, she has made three trips to Phebe Hospital, a primitive 18-bed facility located in central Liberia, as a volunteer with Lutheran Global Missions. Her most recent trip was in January. She hopes the mission will become annual ventures.

On Riegle's first trip to Phebe, she served in pediatrics and worked with patients. She prefers teaching anesthesiology, which she has done on her last two trips, because she says the hospital's health care workers seem to benefit more from education than observation.

"Now they have texts they can read and use to look up information in," says Riegle, who last year donated the entire anesthesiology library to the hospital. "They're fun to work with, especially when I see the growth in their knowledge."

There are five people in the hospital's anesthesiology training program, which Riegle instructed. Among them is Carman Gwinegaal, the only Certified Registered Nurse Anesthetist and wife of Walter Gwinegaal, Phebe Hospital's medical director. Both Gwinegaals received their medical education in the United States.

Riegle is at the sides of women during surgery and may spend up to three hours a day lecturing to the medical staff. Phebe has from seven to 10 patients a day. In addition, it has X-ray, laboratory and EKG services.

Disease in its most severe form runs rampant in the country. Malnutrition, parasites, AIDS, measles, whooping cough, polio, tetanus and dehydration are among some of the prevalent illnesses.

"It's sometimes a challenge, according to Riegle. For example, the hospital has only one monitor, a Nellcor Pulse Oximeter, donated about one year ago. To her disappointment a medical equipment corporation recently refused her request to donate a blood pressure monitor to the hospital.

"In the operating room, you go by the color of the patient and hand blood pressure," Riegle said of monitoring methods available. "What you can hear and feel are it.

Despite these limitations, she is enthusiastic about the strides the hospital has made in the last eight years. Riegle says she has always felt safe with the people of Liberia, but this trip offered another glimpse of the normally peaceful country when the government announced a coup on New Year's Day. That same day, Riegle's plane landed in Monrovia.

"My timing was really terrible," she said. "I heard rumblings in the U.S. that things weren't very good. Liberia is normally a peaceful country. The only fear is from the soldiers."

A 6 p.m. curfew was imposed and military check points were set up throughout the tiny shoreline country, which is roughly the size of the state of Ohio. Though Riegle was 20 miles away from the war zone at the compound, she was aware that all around her innocent children and adults were being brutally murdered by military soldiers.

"As an American, there's no way you can understand what's going on there," she said. "One has to try and keep going back and serving one place, because that's the way you accomplish the most.

"There are two million people in that country. We're important because I've spent six months of my life with them."

Riegle is one of several anesthesiologists from the School of Medicine who make such trips to undeveloped countries. Ellis Taylor, M.D., and Robert Feinstein, M.D., have also served in Honduras, Peru and Ecuador.

Kinka Carter

5
Cat baths may relieve owners' allergies

Legions of cat owners who are allergic to the pets, but refuse to part with them, may find relief from allergic reactions by washing down the coat in their homes. A monthly bath compromises the effectiveness of both forms of treatment. "These patients can unwilling or unable to eliminate cats from their homes," he says. "They can bathe the cats, and also a month-to-month compromise the effective-

Kenneth Ludmerer elected AAAS fellow

Kenneth Ludmerer, M.D., an associate professor of medicine, was elected a fellow of the Association for the Advancement of Science and Engineering in the mid-19th century to 1925. Ludmerer is the author of "Medicine and Allied Sciences," a three-volume work published in 1848, which was considered the country's leading general scientific organization.

"The ideal treatment for the cat-sensitive patient who experiences symptoms of allergic rhinoconjunctivi-
tis, asthma or dermatitis is to remove cats from their environment," says allergist H. James Wedner, M.D., associate professor of medicine at the School of Medicine. "Unfortunately many patients have such symptoms either because they are unwilling or unable to eliminate cats from their homes. These patients can receive pharmacotherapy or immu-

Lichtman named inventor of the year

As a neurobiologist with the School of Medicine, Jeff W. Lichtman, M.D., Ph.D., works at a field where inventions occur everyday as aids to researchers in his lab. It's not everyday, however, that a biologist is recognized for one of his own inventions. That is exactly what happened to Lichtman, an associate professor of anatomy and neurobiology, when he was named Missouri Inventor of the Year by the Inventors Association of St. Louis and the Patent, Trademark, and Copyright section of the Bar Association of Metropolitan St. Louis.

Lichtman received the award in February for devising modifications and improvements for fluorescence microscopes, work he began in order to improve image clarity of specimens he studies. The modifications produce confocal fluorescence images of fixed and living biological material. Confocal scanning microscopy allows for very thin optical sections and also three-dimensional views of tissues. Lichtman downplays his achieve-

Personnel moves off campus temporarily

The School of Dental Medicine is seeking volunteers to serve as patients while it moves its routine dental screening examinations this spring. Volunteers must be at least 18 years old. Those selected patients will receive free dental treatment during the routine screening examinations, scheduled for May 14-27. To identify suitable patients, free screenings will be held April 2-6 at the dental school, located at 4559 Scott Ave. near the intersection of Euclid and Sedge. The screenings will include a medical history, X-rays, oral examination and diagnosis. There is no dental work that is needed, but no treatment.

Dental patients are needed during exams

"This procedure may provide a simple method to reduce the allergen-

'Confocal microscopy is usually a little unusual as a biologist to come up with something that may have more general use,' Lichtman explains. "Lichtman's modifications will have applications in biology, ophthalmology, clinical pathology and quality-control methods used in manufacturing products such as semiconductors.

Last December, Lichtman and former colleague William Sunderland, who created the computer software for the microscope, were awarded two patents on their work. Several other patents on the device are pending.

Newport Corp., a precision laser and optics products company that is branching out into biological research, will manufacture the device, which Lichtman says will be available as a kit and can be affixed to existing microscopes. Washington University holds title to the invention and is working with the Fountain Valley, Calif.-Based Newport Corp., on final licensing specifications.

The kit should be ready for purchase this fall, according to Lichtman. He expects Newport to sell about 300 kits the first year and about 1,000 every year after that. The kits are expected to cost between $10,000 and $15,000, significantly less than existing confocal microscopes, which can cost up to $150,000.

It's sort of a bonus," he says of the invention. "Developing techniques that are useful requires changing things. Occasionally, you do something useful that can be applied in other laboratories. It's a little unusual as a biologist to come up with something that may have more general use.

'The kits are expected to cost between $10,000 and $15,000, significantly less than existing confocal microscopes, which can cost up to $150,000.

Lichtman explains. 'What we have created is an inexpensive alternative.'

He and Lewis Thomas, M.D., who is director of the biotechnological research laboratory and was instrumental in designing the scanning disk for the device, are presently helping Newport Corp. on design of the disk.

Of the recognition he has received, Lichtman says, "It's so out of the realm of what I'm used to. But it's been fun, I've enjoyed it."
PERSONNEL NEWS

Bond market, social choice accounts available

In March 1990, the new CREF Bond Market Account — "open for business" — another one of the two new accounts set forth in The Future Agenda, TIAA-CREF's blueprint for innovation in this new decade, became available. New accounts now available in all Washington University retirement plans are the Social Choice Account, a traditional annuity; and the four CREF accounts: the Stock, Money Market, Bond Market and Social Choice accounts.

Bond Market Account

The CREF Bond Market Account lets you diversify through its investments in the bond market. The Bond Market Account's goal is favorable long-term returns through high credit quality investments.

The account will invest primarily in high and medium quality fixed-income securities, including:

• Publicly traded corporate bonds;
• U.S. Treasury and Mortgage-related or other asset-backed securities.

It also will invest in the money market to take advantage of attractive short-term opportunities and to provide a source of liquidity.

The Bond Market Account is an accumulation-only account. You can use it while you are saving for retirement, but if you withdraw your money before age 59 1/2, you will have to pay taxes and a 10 percent penalty on all the money you withdraw, as well as a 5 percent early withdrawal penalty. If you choose to participate in the Social Choice Account, a traditional annuity, you will also have to pay taxes on your annuity distribution.

New dividend rates apply to TIAA accumulating annuities

On Feb. 21, 1990, the TIAA Board of Trustees voted new dividend rates for TIAA accumulating annuities. These rates are effective March 1, 1990, through Feb. 28, 1991, for premiums paid during different periods shown in the chart. Separate interest rates are credited to TIAA accumulating annuities transferred to TIAA during the periods shown in the chart.

A total interest rate of 8.5 percent will be applied on all new annuities arising from premiums remitted and dividends credited to TIAA Retirement Accumulations during periods applied during earlier periods, the interest rate will vary between 6.75 percent and 5 percentage points indicated in the table to the right.

The rates being credited on some of the older vintages have declined as principal repayments and investment income from older, higher-yielding assets are reinvested at the lower interest rates available today. This trend has been exacerbated by an increasing volume of unscheduled redemptions, as borrowers have refinanced their borrowings at the lower rates available in recent years.

These factors had a similar impact on the dividend rates during earlier interest rate periods. For more information, see the article titled "1990 Anniversary Income" on page 4 in the December 1989 issue of the Benefit Plan Counselor. The TIAA Retirement Income (SRA) accumulations arising from premiums remitted and dividends credited to the Social Choice Account during periods shown in the chart will be credited to TIAA Retirement Accumulations will be credited to meet the extra costs associated with the cashability feature of SRA contracts. SRA premiums remitted prior to 1986 were subject to a premium loading charge to meet these costs.

TIAA's $45 billion investment portfolio is diversified among mortages, direct placement loans, publicly traded bonds and real estate equity.

Professional job searches under way

Washington University is conducting searches to fill professional positions on the Hilltop Campus. For complete job descriptions and qualifications required for these positions, call the Personnel News office.

Directors of Student Service Health

Washington University is seeking a patient administrator, Director of Student Health Service.

The position is available July 1, 1990, but the search can begin at any time.

Applicants should have at least three years of supervisory experience, preferably in a research environment. Applicants must have an MLS from an ALA accredited library school, second master's preferred. Applications are also being accepted as head of Department of Library Services.

Social Choice

The CREF Social Choice Account takes a more explicit approach to socially responsible investing than the other CREF accounts or TIAA. Employees who want to invest according to social criteria can do so with this account, which invests in socially responsible domestic and foreign companies.

TIAA's $45 billion investment portfolio is diversified among mortages, direct placement loans, publicly traded bonds and real estate equity.

Total (Guaranteed plus Dividend) Interest Rates on TIAA Accumulating Annuities (effective 3/1/90 - 2/28/91)

<table>
<thead>
<tr>
<th>Periods during which funds were applied</th>
<th>1/1/90</th>
<th>3/1/90</th>
<th>12/31/89</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIAA Retire-</td>
<td>8.50%</td>
<td>9.25%</td>
<td>8.75%</td>
</tr>
<tr>
<td>ment Account</td>
<td></td>
<td></td>
<td>10.00%</td>
</tr>
<tr>
<td>Group and Retirement Account</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplemental Retirement Account</td>
<td>8.25%</td>
<td>9.00%</td>
<td>8.75%</td>
</tr>
</tbody>
</table>

Premium expense charge is eliminated

Today your Supplemental Retirement Annuities cost less — plus, you have more investment choices.

If you made a $100 contribution to your CREF SRA last month, $99.50 actually was invested. This month, $100 will be invested. The difference: The 0.5 percent premium expense charge has been eliminated for all contributions.

Now there is no difference between how much you contribute and how much will grow in your CREF SRA or in your CREF Retirement Account. Neither has a premium expense charge now. However, differences still exist between your TIAA SRA and TIAA Retirement Account — the TIAA dividend credited to SRA contributions after 1/1/90 is lower, currently by 0.25 percent.

The reason for the differential is that cashability has an effect on TIAA's investments. Because of SRA cashability, TIAA must hold more liquid investments for them. In general, the more liquid investments are, the less they earn. So, TIAA SRFs are credited with a lower interest rate than noncashable TIAA Retirement Account.

Personnel News

Personnel News appears monthly in the Record and is prepared by Glenn W. White, vice chancellor for personnel and affirmative action, and other members of the Personnel Office.

Personnel News is designed to keep Washington University employees and their families informed of the benefits and opportunities available at the University.