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Wisconsin Alumnus

Volume 82, Number 5
July/August 1981

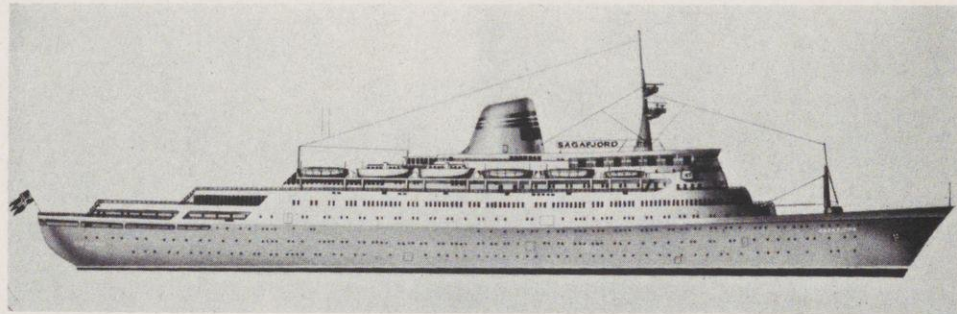
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WHITE DWARFS AND BLACK HOLES

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Letters

Wisconsin Alumnus

Volume 82, Number 5
July/August 1981

'His Greatest Accomplishments'

The March/April *Wisconsin Alumnus* was sent to me because of Kent Hamele's wonderful article about the Hoofers and my late husband, Harold C. Bradley. The Hooper organization and the dormitory idea at Wisconsin were thought by Harold to have been his greatest accomplishments during his association with the University. . . .

Harold loved the Hoofers and the Memorial Union and had endless stories to tell me about them. I treasure the plaque of appreciation given him by the Hoofers in 1948, as well as the honorary membership issued in 1974. I also have a pin with the Hoofers' insignia on one ski but, unfortunately, Harold threw away the white felt piece on which were the red W and black horseshoe, when he thought it was too soiled.

Please convey to Kent Hamele my appreciation for his great article and especially for his last paragraph.

RUTH A. BRADLEY
Oakland, Calif.

....It's a splendid article—accurate, well constructed, and with an ending that produced a lump in my throat.

My congratulations!

PORTER BUTTS
Madison

'Good Job'

I really enjoyed the article on the Women's Transit Authority (WA, May/June). Mary Kilgore did a good job of conveying the philosophy and purpose of WTA.

LAUREL KINOSIAN
*Volunteer driver, WTA
Madison*

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THE WISCONSIN ALUMNUS (USPS 687-660) is published six times a year: January, March, May, July, September, and November. Second-class postage paid in Madison, Wis., under the act of March 3, 1879. Subscription price (included in membership dues of the Wisconsin Alumni Association) is \$20.00 a year. Editorial and business offices at 650 N. Lake St., Madison, Wis. 53706.

On Wisconsin

I feel certain you will share our enthusiasm for an observance which begins this month. July 16 is Higher Education Day across the country, and a year of special programs is planned at schools and colleges including here at the University of Wisconsin, which is a charter member of the Council for the Advancement and Support of Education (CASE).

Throughout the coming year we'll be recognizing the importance of higher education in America and the vital contributions made to it by those not only in the field, but in business, the news media and government, as well.

Headquartered in Washington, D.C., CASE advances education in two ways: it helps its member-representatives to increase their professionalism, and it serves as a major public relations arm for education. More than 2,100 colleges, universities and secondary schools are institutional members. Representing them are more than 9,000 individuals in alumni administration, educational fund raising, government relations and institutional relations, information services, publications, and the management of advancement programs. A number of presidents, administrators and admissions directors are also member representatives.

The UW-Madison is well represented in CASE with sixteen professionals currently holding membership. For the past two years it has been an honor for me to serve on its Board of Trustees. As such I've had an opportunity to keep current on the state of higher education and to provide input regarding the concerns and goals of our University in the years ahead.

**AMERICA'S
ENERGY IS
MINDPOWER**

Make higher education your priority.

As a UW graduate, you know the important role this great University has played in shaping the future of mankind. Historically, it has been among the top institutions in the nation in the amount of research dollars it has attracted from outside sources. This speaks highly of our national reputation and faculty. Six of our alumni have won Nobel Prizes; five more faculty or former faculty have been so honored (three while here), and nearly forty faculty hold membership in the National Academy of Sciences. And, of course, distinctions continue to mark those in the other disciplines.

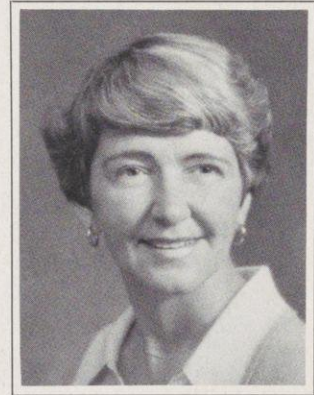
Two agricultural genetics firms have announced plans to locate here in Madison, explaining that the immediate presence of the University and its outstanding faculty and research facilities was major to their decision to do so.

Our academic program has also received national recognition over and over again. A recent national survey by *The Chronicle of Higher Education* found our academic departments high in twelve of the nineteen disciplines studied. (Agriculture placed second; the biological sciences third; foreign languages and sociology fourth; education and history fifth; chemistry sixth; mathematics-statistics seventh; engineering and political science eighth; economics ninth and psychology tenth.)

A quality academic program, for which our University is noted, is important to you, the graduate. You have made a considerable investment of time and money in your diploma; this investment should be protected.

Our emphasis in future years must be to preserve the national reputation of UW-Madison. Many of us believe that recent budget cuts place the future quality of our University in grave jeopardy, yet in spite of them we must strive to improve in many areas. (Faculty salaries are a good example: a new study, also by *Chronicle*, put the salaries of full professors here at seventh in the Big Ten.)

The University needs the support of all of its alumni. The UW Foundation and WAA both offer programs to assist it, and we can continue to do that only if we can continue to rely on you. We're all very proud of the many contributions this University makes to higher education in America. Let's keep it that way. □



Gayle M. Langer
Associate Director

WHITE DWARFS AND BLACK HOLES

UW CONTRIBUTIONS TO THE SPACE TELESCOPE

By Jean Lang M.S. '73 and Linda Weimer M.S. '72

When Galileo pieced together his first crude telescope in 1609, he provided a whole new vision of the universe. Exploring the heavens with his simple device, he found that the moon's surface was uneven and mountainous, that there were spots on the sun and that the Milky Way was actually made up of separate stars. Revealing a universe ten times more detailed than that seen with the naked eye, Galileo's telescope marked the birth of modern-day astronomy.

Today, almost 400 years later, an event of comparable cosmic importance will soon take place. In 1985, the National Aeronautics and Space Administration is scheduled to send a huge telescope into orbit around the earth. Riding above the earth's distorting atmosphere, it will enable astronomers to see objects that are fifty times fainter and seven times farther away than those now visible through earthbound telescopes.

This capacity will literally permit scientists to look back in time to the origins of the universe. It will also give them a better idea of the fate of galaxies and stars like our sun; and it will shed light on questions about how fast the universe is expanding and whether planets like the earth exist in other solar systems. Astronomers expect to discover new celestial bodies and to confirm or refute the existence of those that are now largely theory, like black holes.

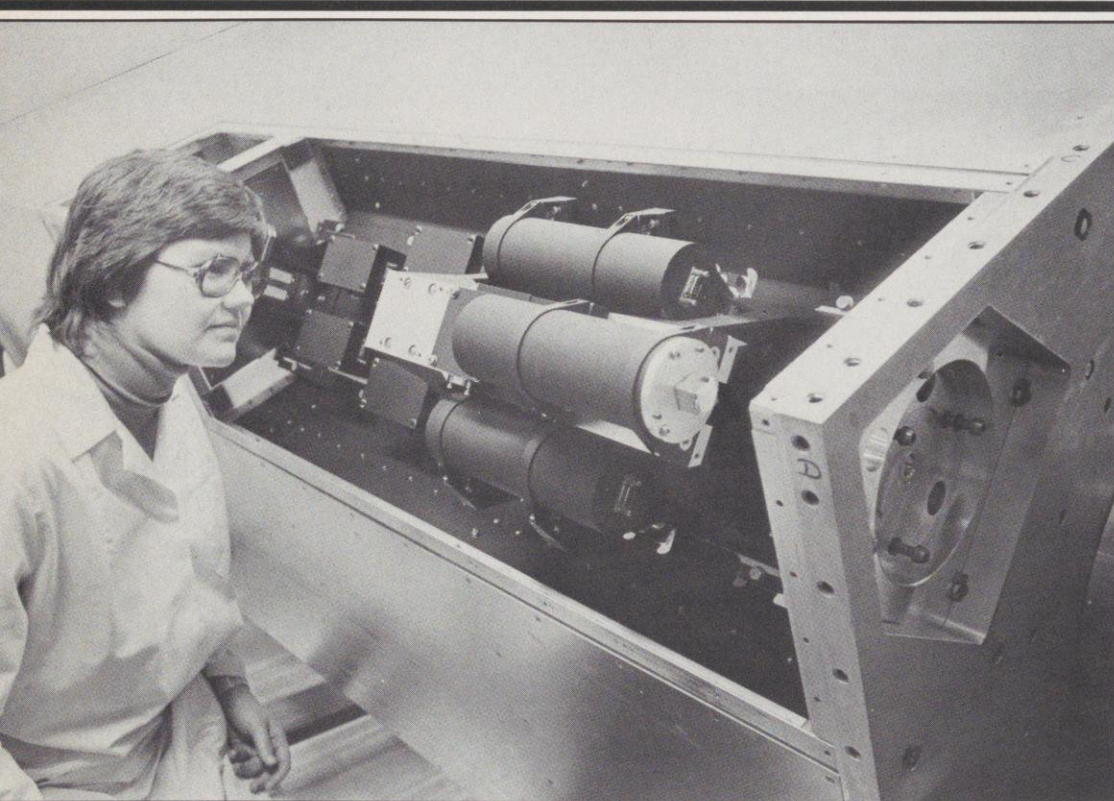
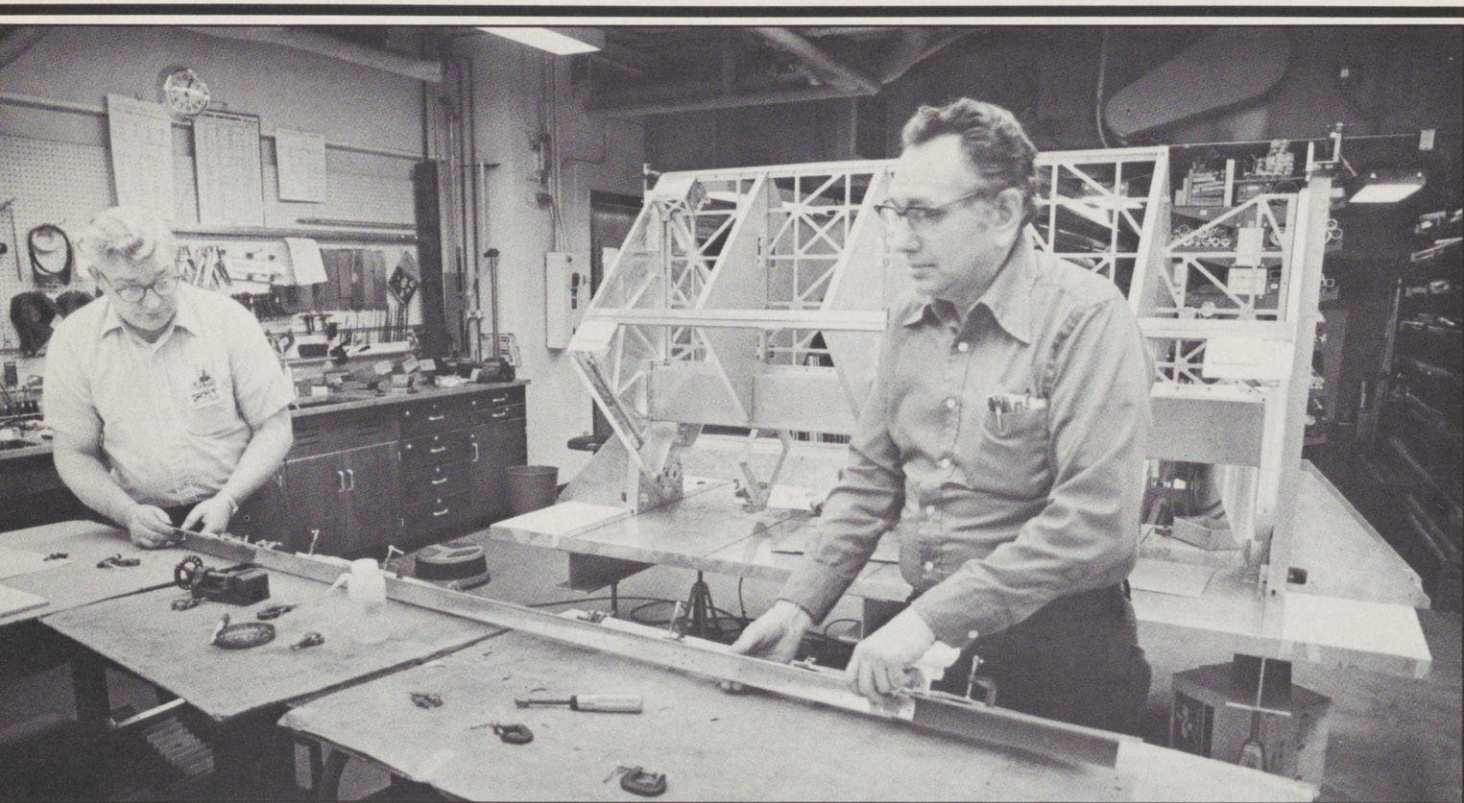
By all accounts, the launching will be a momentous event in the field of astronomy and when it occurs, the University will have played a major role in making it happen. Faculty



members in the astronomy department have been working on this project since 1973. In fact, astronomer Arthur Code, co-investigator in the design of one of the space telescope's two cameras, was recently named acting director of the new Space Telescope Science Institute at Johns Hopkins University in Baltimore. The Institute will house some 240 resident and visiting astronomers who will work with the new instrument. The ten-ton telescope will be carried into space inside the space shuttle and placed into orbit 360 miles above the earth's surface. It will travel at 20,000 miles per hour, circling the earth every ninety minutes.

"While the space telescope will advance nearly all areas of astronomy," said Prof. Code, "its special abilities may be best suited to solving the cosmogonic problem—that is, when and how did the universe begin?" Most astronomers now agree that the universe is expanding, but discovering the rate of that expansion has proven a difficult task. Finding its velocity—known as the Hubble constant H —is crucial. Reading the changing luminosities of the stars is one clue to that finding. The high-resolution space telescope (ST) will enable much more accurate measures of the absolute brightness of stars, and will lead to better estimates of the distances between them and the rates at which they are moving apart. These observations, when calibrated, will shed light on the value of H and will enable scientists to calculate the distances to the most remote galaxies observable. *continued*

Rosette Nebula in Monoceros.
From a slide by Kitt Peak National Observatory.



Above: Engineering technician Robert Sutton (left) and instrument maker Richard Pfeifer work on construction of the photometer and its housing.

Below: Technical assistant Carrie Harris with the photometer as it sits in a mock-up housing.

With the ST. Code told us, astronomers will be able to see eighty-four billion trillion miles or fourteen billion light years into space. (Some believe that the universe was formed about fourteen billion years ago.)

Professor Robert Bless, also on our astronomy faculty, said, "We will literally look back in time to roughly the beginning of the universe and see distant stars as they looked billions of years ago when the galaxies were formed." The position of the telescope, out beyond the earth's atmosphere, is what will make these spectacular observations possible. From earth, astronomers' view of the stars is blurred. "The atmosphere scatters light and absorbs ultraviolet radiation," said Bless. "It obscures many of the most interesting objects in the universe, so we're going to step out beyond it." His special contribution to the project has been the design and development of a high-speed photometer that will

measure a celestial object's light intensity and changes in brightness over a broad wave length.

Under Bless's direction the photometer is being designed and built by a team at our Space Science and Engineering Center (SSEC) and the astronomy department's Space Astronomy Laboratory. It is one of five instruments that will ride behind the telescope's ninety-four-inch mirror.

In 1977, the UW team won a competitive battle for the NASA contract with a "deceptively simple" photometer design, said Bless. "We wanted to make it as simple as possible to minimize potential problems. We've used well-known detectors and techniques, pushing them to a higher level and taking advantage of the clear sky up there." The device has no moving parts which could break down in space, he added. Magnetic fields move a tiny electron beam to adjust the in-

of the ST package, to be replaced if necessary in orbit by astronauts working from the Space Shuttle. He said that last June a test version of the photometer was shipped to Goddard Space Flight Center in Maryland for tests. Now, the final flight unit, complete with electronics, is being built at SSEC, and is expected to be finished by this fall. Once aloft, it will be able to pick up radiation within and beyond the spectrum of visible light and to detect exceedingly rapid changes in these levels of radiation.

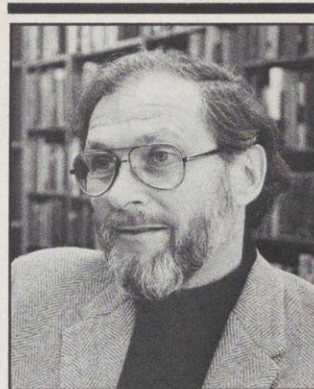
"We have found in the last ten or fifteen years that some astronomical objects change light intensities very quickly," explained Robert Bless. "One pulsar in the Crab Nebula, for instance, puts out flashes of radiation thirty times a second. But it's been hard to measure these rapid changes using ground-based telescopes be-

ness. The mass of these is usually equivalent to that of our sun, but their densities are millions of times greater. The brightness of a white dwarf changes over a matter of seconds, and those changes will now be measureable.

Another late stage of stellar evolution is the neutron star. The identification of the Crab Nebula pulsar established the existence of these small celestial bodies. Thought to be only about ten miles wide and so dense that a bit the size of a grain of sand would weigh thousands of tons, neutron stars are believed to rotate very rapidly, sending beams of radiation out into the universe like cosmic lighthouses.

The photometer will not only tell us more about these known phenomena but also may prove or disprove the existence of a theoretical one—the black hole.

A black hole is thought to be



Astronomer Robert Bless is directing the design and construction of the Space Telescope's photometer.

until now in the earth's atmosphere.

A third UW-Madison astronomer, Blair Savage, is involved in the space telescope project. He is responsible for calibrating the detectors on the High Resolution Spectrometer, another part of the ST instrument package. Spectrophotometry reveals information about the chemical composition of the stars and interstellar matter. Savage will use the HRS to study the rarified gas between stars.

Because of their involvement in the space telescope project, the UW astronomers will be guaranteed about a month's observing time. After that, they will have to compete for it with astronomers from all over the world.

The space telescope's launching in 1985 is expected to revolutionize the astronomer's view of the universe.

"The galaxies may be evolving, changing brightness with age," said Arthur Code. "And we think there is even galactic cannibalism, galaxies eating up other galaxies and becoming brighter. If so, we have been misjudging the size and age of the universe, but only the combination of instruments aboard the space telescope can tell us that for sure." □

Linda Weimer is assistant director of our Sea Grant Institute. Jean Lang is editor of the Graduate School's REDBOOK, from which this feature is reprinted.

We will look back to the beginning of the universe and see the stars as they looked when the galaxies were formed.

strument.

Of all the universities with space telescope contracts, the UW is the only one able to design and build the equipment right on campus, Bless explained. "Because we have the Space Astronomy Laboratory, SSEC and various engineering labs, we can do projects of this sort that other universities apparently cannot."

The photometer, a very sophisticated light meter, will weigh about 600 pounds and be contained in an instrument package about the size of a telephone booth, said Evan Richards, in charge of its production for the SSEC. The device should last several years. It is designed, as are the other parts

cause of the 'twinkling' effect caused by earth's atmosphere.

The UW's photometer will enable Bless and other astronomers to look at these very-rapid changes; it's sensitive enough to measure even those that occur at a one-hundred-thousandth of a second, catch them in brightness and convert them to an electrical signal to be beamed back to earth.

Objects that fluctuate in brightness in this way are all at the ends of their lives, said Bless. So, the photometer will "tell us something about those that are heading for the graveyard."

One such is the white dwarf, a star of high surface temperatures and low intrinsic bright-

ness. A collapsed star whose gravitational pull is so powerful that even light cannot escape its hold. There is good reason to suspect that black holes exist, but that has not as yet been shown.

"There has been much speculation about them and about how a star near a black hole might have detectable pulsations or wiggles," said Bless. "I'm not sure what we'll find but we now have the equipment to take a very close look."

For the first time, too, they will be able to measure ultraviolet radiation, a major form of star brightness and a source of knowledge about heat and chemical components, but lost



In a Persian Market

Once upon a time CIA money talked in Iran.

By Stephen E. Ambrose '57, Ph.D. '63

Between World Wars I and II, the U.S. did almost no spying on anyone, and President Harry Truman reverted to this policy immediately after World War II. But during that war, Dwight Eisenhower, as Supreme Commander of the Allied Forces in Europe and impressed by the success of the British Secret Service, commanded a series of covert operations that played a crucial role in the final victory. When he became President, he encouraged the growth of the CIA, and found himself at the top of an intelligence pyramid responsible for some of the greatest coups in espionage history as well as for some of its most ignominious failures. In his new book *Ike's Spies*, Stephen Ambrose charts that history, from its wartime inception through Eisenhower's administration. In the excerpt below, he describes the CIA's first major postwar activity of the Eisenhower presidency. Stephen Ambrose is a professor of history at the University of New Orleans.

Midnight, August 1-2, 1953. *A large, ornate garden in Teheran, Iran. A medium-sized, medium-height, rather nondescript American, wearing a dark turtleneck shirt, Oxford-gray slacks, and Persian sandals, opens the gate to the garden, slips out, glances up and down the street, and silently climbs into the back seat of an ordinary-looking black sedan. Without a backward glance, the driver pulls away slowly, smoothly, and heads toward the royal palace. In the back seat, the American huddles down on the floor and pulls a blanket over him.*

At the palace gate, the sentry flashes a light in the driver's face, grunts, and waves the car through. Halfway between the gate and the palace steps, the driver parks, gets out, and walks away. A slim, nervous man walks down the drive, glancing left and right as he approaches. The American pulls the blanket out of the way and sits up as the man enters the car and closes the door.

They look at each other. Then His Imperial Majesty, Mohammed Reza Shah Pahlavi, Shahanshah of Iran, Light of the Aryans, allows himself to relax, and even smile.

"Good evening, Mr. Roosevelt," he says. "I cannot say that I expected to see you, but this is a pleasure."

Roosevelt—Kermit ("Kim") Roosevelt, Teddy Roosevelt's grandson and FDR's cousin—quickly explains that he has entered Iran illegally, that his cover name is James Lochridge, and that he is there as a personal representative of President Dwight Eisenhower and Prime Minister Winston Churchill. "President Eisenhower will confirm this himself," Roosevelt states, "by a phrase in a speech he is about to deliver in San Francisco—actually within the next twenty-four hours. Prime Minister Churchill has arranged to have a specific change made in the time announcement of the BBC broadcast tomorrow night. Instead of saying, 'It is now midnight,' the announcer will say, 'It is now'—pause—exactly midnight."

Having established his bona fides, Roosevelt explains that his purpose in coming is to assure the Shah that he has the full backing of the American and British governments, that Washington and

London are anxious to help him overthrow his prime minister and ensure that H.I.M. retains his throne.

The thirty-four-year-old Emperor smiles, as well he might. To have the complete, unquestioning support of a Roosevelt, Eisenhower, and Churchill is, after all, a reassuring feeling, especially to a shaky monarch surrounded by rumors of coups, countercoups, plots, and revolutions, with the additional problem of sharing a long, virtually undefended border with the Soviet Union. Even better than the general promise of support from Eisenhower and Churchill is Roosevelt's pledge that he would personally set in motion a series of events that would rid the Shah of his Iranian enemies.

The CIA's first major covert action under Eisenhower's orders is launched.

How had things come to such a pass that a Roosevelt was sneaking around at midnight, hiding under blankets, while Eisenhower altered a speech and Churchill used the BBC for personal messages, all in support of a potential dictator whose sole political objective was to overthrow a highly popular prime minister in favor of a pro-Nazi general? A brief answer is that oil and communism make a volatile mixture. A fuller response takes into account the complexities of postwar international relations and the recent history of Iran.

There are only two facts about modern Persia—Iran—that truly matter to the rest of the world. It has oil, and it is Russia's southern neighbor. Because of the oil, the British had moved in on Iran in 1909, when the Anglo-Persian Oil Company (in which the British Government controlled 52 percent of the stock) obtained a sixty-year concession which gave it exclusive rights to explore and exploit the oil of Iran. Because of the border, Britain and Russia (with American support) had invaded Iran in 1941, where in a matter of hours they destroyed the Imperial Iranian Armed Forces. This was as much an act of great-power highhandedness and brutality as Hitler's invasion of Denmark, although in this case the voices of outraged protest were exclusively Iranian. The purpose of the invasion was to provide a corridor for the shipment of American lend-lease goods into Russia.

The ruler of Iran in 1941 was Reza Khan, an illiterate officer in the Persian Cossack Brigade who had led a coup against the Qajar regime in the 1920s and established himself as Reza Shah, founder of the Pahlavi dynasty. Iran was a constitutional monarchy with a two-house Parliament. The British and Russians believed that Reza Khan was potentially pro-Nazi, so they forced his abdication, sent him into exile, and put his twenty-three-year-old son on the throne.

The new, young Shah looked the part of a monarch. He carried himself stiffly and was strikingly handsome, despite—or perhaps because of—a highly prominent nose. But despite the impression of strength he gave, he had been a sickly boy, dominated by his stern and cruel father, and was filled with self-doubt

August 23, 1953.

The Shah, back from a brief exile, with General Nazeri.

Wide World photo.

From the book *IKE'S SPIES* by Stephen E. Ambrose. Copyright ©1981 by Stephen E. Ambrose. Published by Doubleday & Company, Inc.

and fears of his own weakness. He was easily manipulated by the occupying powers (which after 1942 included the Americans).

At the Teheran Conference, those powers pledged themselves to withdraw their troops from Iran within six months of the end of hostilities. In late 1945, Britain and America kept their word, but the Russians stayed on in the northern Iranian province of Azerbaijan, where they attempted to inspire a revolt that would lead to a secession of the province and its incorporation as a "republic" into the Soviet Union. This was the first real crisis of the Cold War. President Truman sent America's newest aircraft carrier, the *Franklin D. Roosevelt*, to the eastern Mediterranean as a show of force to back his demand that the Russians get out of Iran. After negotiating a deal that gave the Russians access to Iranian oil, Stalin did pull his troops out. The Iranian Parliament then refused to ratify the deal, and Russia suffered a major diplomatic setback.

The American attitude toward Iran in the immediate postwar year was set by Secretary of State Dean Acheson, who believed the United States should play a supporting role in Iran's resistance to the Soviet pressure. As a result, relations between America and Iran were excellent. The Shah visited the United States, where he had a successful audience with Truman and met Eisenhower, then president of Columbia University.

In 1947, Kim Roosevelt, Harvard graduate, historian, and Middle Eastern expert during the war, was writing a book called *Arabs, Oil and History*, and he had a long interview with the Shah in his palace. Roosevelt was then thirty-one, the Shah twenty-eight. They impressed each other favorably, or so Roosevelt later claimed.

The United States, delighted at Iran's successful resistance to Soviet encroachment, rewarded the Shah's government with new programs of technical and financial aid, including a military mission of some eighteen officers who oversaw the distribution of weapons from American war surplus stocks worth some \$60 million. The badly burned Soviets, meanwhile, fearful of an increased American presence on their southern border, adopted a cautious and rather conservative attitude toward Iran.

With the Russians checked and the Americans providing support, the Iranians were in a position to turn on their real enemies, the hated British. They had much to complain about. The Anglo-Persian Oil Company paid more in taxes to the British Government than it did in royalties to Iran. Equally galling, the company used the huge profits it earned in Iran to expand its oil output in other parts of the world. Further, to the British the Iranians were just another set of "wogs," to be treated with contempt and excluded from any but the most menial posts in the operation of the Abadan refinery.

The situation was intolerable. It presented a marvelous opportunity to any Iranian politician who had the courage to lead. The one who seized the chance was a remarkable old man, Dr. Mohammad Mossadegh, leader of the National Front. Seventy years old in 1951, he was a rich landowner, educated in France and Switzerland, worldly wise, a successful spellbinder of a speaker who had been elected to the Majlis (the second house of the Parliament) in 1915, and who was generally regarded by those Westerners who dealt with him as a completely unreasonable, demagogic, and xenophobic man.

Tall, thin, bent, a semi-invalid who often appeared in public clad only in pajamas, he would burst into tears at the most inappropriate moment, or faint dead away. (One State Department official said, "Mossadegh has a nose that makes Jimmy Durante look like an amputee") His favorite place for doing business was his bedroom, where he would recline, propped up by pillows, and alternatively cackle and cry.

Mossadegh was the first Middle Eastern politician to demand the complete nationalization of his country's oil fields. The Shah's Prime Minister, General Razmara, opposed such drastic action. On March 7, 1951, a member of the Crusaders of Islam, one of the groups in Mossadegh's National Front, assassinated Razmara while he was attending a ceremony in a mosque. Mossadegh was the overwhelming popular choice to succeed Razmara. Reluctantly, the Shah appointed him Prime Minister. The same day, May 2, 1951, the Parliament passed a bill nationalizing the oil industry. A week later the Majlis gave Mossadegh's government a vote of confidence by a majority of ninety-nine to three.

For the British, the wogs were on the rampage. For the Iranians, a war of liberation had begun against the colonialists. For the Americans, here was an opportunity to get a foothold in the rich Iranian oil fields, and a window to Russia. The British refused to accept the compensation payment for the company offered by Mossadegh, shut down Abadan cold, refused to buy oil from Iran, and put various legal obstacles in the way of any country that was willing to purchase Iranian oil, arguing that such oil was in fact stolen goods and threatening to take any purchaser to court.

The shutdown of Abadan forced a crisis in Iran. With no moneys coming in from oil royalties, the government was rapidly going bankrupt. In July 1952, Mossadegh demanded authority to govern for six months without recourse to Parliament, and that he be given the additional post of Minister of War. The Shah refused and instead demanded (and got) Mossadegh's resignation. Immediately the National Front, supported by the Tudeh (Communist) Party, launched riots and demonstrations. Mossadegh's replacement inflamed the situation by indicating that he was going to give in to the British on the question of oil nationalization. The riots grew worse. Unable to control them, the new Prime Minister resigned. Five days after the Shah had fired Mossadegh, he had to reappoint him.

In October 1952, Mossadegh broke off diplomatic relations with Britain. Meanwhile, Winston Churchill once again became Prime Minister of Great Britain, and, in November 1952, Eisenhower was elected President of the United States. The two comrades in arms from World War II now had their opportunity to solve the Iranian "problem."

In January 1953, Mossadegh sent President-elect Eisenhower a three-page cable in which he congratulated Ike on his election victory, then plunged into an extended discussion of Iranian affairs. The theme was summed up in one sentence: "For almost two years," Mossadegh wrote, "the Iranian people have suffered acute distress and much misery merely because a company inspired by covetousness and a desire for profit sup-

ported by the British government has been endeavoring to prevent them from obtaining their natural and elementary rights." In a hand-drafted reply, Ike said his own position was impartial, that he had no prejudices in the case, and that he hoped future relations would be good.

In fact, however, everything the President-elect was hearing was anti-Mossadegh. Churchill and the British seized on the Tudeh's support of the Prime Minister to make the point that the old man was either a Communist or a victim of Communist intrigue.

The British, meanwhile, had approached Kim Roosevelt, well known to them from old days and currently one of the top CIA agents. Sir John Cochran, acting as spokesman for the Churchill government, proposed that the British Secret Service and the CIA join forces to overthrow Mossadegh. Somehow Mossadegh learned of the plot. He then denounced the Shah for his intrigues with foreign interests and began to agitate for the Shah's abdication.

At this point the Shah lost his nerve. On February 28, 1953, he announced that he would leave the country, along with his queen and entourage. The announcement brought on riots in the streets of Teheran. The Tudeh Party, along with the United Front, marched in support of the Prime Minister; at the other end of town, as H.I.M. recorded in his memoirs, "the mass demonstrations of loyalty to the Shah were so convincing and affecting that I decided to remain for the time being." He canceled his agreement to abdicate.

The active support of the Tudeh for Mossadegh fed the impression that the Prime Minister had gone over to the Communists, and for their own reasons the British—who had since the war lost colonies all around the world, a situation the new Churchill government was determined to reverse—clamored about the dangers of a Communist takeover in Iran. Strangely enough, no one seemed to notice that throughout the crisis, in which the stakes were nothing less than one of the world's great oil pools, the Russians were content to stand aside. Nor did anyone in the West ever point out that Mossadegh had not appealed to his northern neighbor for help.

Mossadegh's policy was to attempt to split the United States and Britain. To that end, in May 1953, he once again appealed to Ike. In a long personal message he begged the President to help remove the obstacles the British had placed on the sale of Iranian oil and to provide Iran with substantially increased American economic assistance. "I refused," Ike recorded bluntly, "to pour more American money into a country in turmoil in order to bail Mossadegh out of troubles rooted in his refusal to work out an agreement with the British." (It should be pointed out here that in those happy days, the United States was itself an exporter of oil, and in the world as a whole far more oil was being pumped out of the ground than was being consumed. Mossadegh's problem was that the world of the early 1950s could get along quite well without Iranian oil.)

Iran was by now on the edge of financial and economic ruin. The Truman administration had increased American aid from \$1.6 million before Mossadegh came to power to \$23.4 million for the fiscal year 1953, but that was not even close to enough money to make up for the lost oil revenue. When Ike turned

down his plea, Mossadegh was forced to draw money from the pension funds and the national insurance company.

Moderates in Iran began to turn against the Prime Minister. In response, he suspended elections for the National Assembly and held a referendum to decide if the current National Assembly should be dissolved. He arranged the election so that those in favor of dissolution and those against it voted in separate, plainly marked booths, which were, of course, closely watched by his supporters. Under those circumstances, it was no surprise that Mossadegh won the referendum by 99 percent to 1 percent.

To Ike, the rigged election looked for sure like Communist tactics. He concluded that if "old Mossy" was not a Communist himself, then he was either a fool or a stooge for the Communists. This impression was very much strengthened when Mossadegh turned to the Soviets for help. On August 8 the Russians announced that they had initiated negotiations with Iran for financial aid and trade talks.

Ike decided it was time to act. He ordered the CIA to go ahead with a plan that had been initiated by the British Secret Service, picked up by Kim Roosevelt, and approved five weeks earlier by his State Department in a high-level meeting in the Secretary of State's office.

That meeting inaugurated the CIA's covert-action program, going beyond simple financial support for America's overseas friends, to active intervention in the affairs of a foreign nation, to the point of overthrowing a government.

The meeting began when Kim Roosevelt laid before Secretary of State John Foster Dulles a thick paper outlining a plan of clandestine action, code name AJAX. Picking it up, the Secretary glanced around the room, smiled, and said, "So this is how we get rid of that madman Mossadegh!" No one laughed; indeed, some of those around the table flinched.

Among those present was Bedell Smith, whom Ike had moved from the CIA to the State Department, where he was now the Under Secretary of State. Bedell was a neighbor and old friend of Roosevelt's. He already knew of and had approved AJAX. Smith's replacement as director of the CIA, Allen Dulles, was also there. He, too, knew and approved of AJAX. A third insider was Loy Henderson, our Ambassador to Iran, "a gentleman himself," Roosevelt recorded, "who preferred dealing with his foreign colleagues in a gentlemanly fashion. But Henderson was one of a small band of distinguished foreign-service officers of that era who understood the realities of life in this world we live in." In other words, Henderson too supported AJAX.

There were a number of State Department officials present who were not in on the plot, including Robert Murphy, who had been Ike's first spy back in North Africa eleven years earlier. The new Secretary of Defense, Charles Wilson ("Engine Charlie," former head of General Motors) was there, ruddy-faced, white-haired, gruff, blunt to the point of embarrassment.

A group of hardheaded realists, in short, men of vast experience, able, cynical, accustomed to assessing evidence and making tough decisions, unafraid to take risks. Men Ike trusted to give him sound, practical advice. If Roosevelt could convince them that AJAX could work, they would convince Ike.

The first task, Roosevelt said, was to organize military support for the Shah. The chief of staff, General Riahi, was a supporter of Mossadegh. He would have to be removed or circumvented. The key to AJAX was to be prepared to give the Shah prompt support, both military and public, when he announced the dismissal of Mossadegh and the appointment of Zahedi.

"We are quite satisfied, sir," Roosevelt concluded, turning to Secretary Dulles, "that this can be done successfully. All we wait upon is your decision."

Allen Dulles spoke first. "Kim, you had better cover two more points before the Secretary comments: first, on the estimated cost, and secondly, I think you should give your idea of the 'flap potential'—what could happen if things go wrong."

Roosevelt responded that the cost would be minimal, one or two hundred thousand dollars at the most. On the second point, he said again that he saw no danger of failure, but if he had totally misjudged the situation and things did go wrong, the consequences "would be very bad—perhaps terrifyingly so. Iran would fall to the Russians, and the effect on the rest of the Middle East could be disastrous. But I must add this: These are the same consequences we face if we do nothing."

The Secretary of State then polled the men around the table. Most signified consent with the least possible commitment. Bedell Smith, surly as always, snarled that of course they should proceed.

Robert Murphy, the only man present with some experience in overthrowing governments, nodded his assent. Charles Wilson was enthusiastic. Loy Henderson spoke gravely: "Mr. Secretary, I don't like this kind of business at all. You know that. But we are confronted by a desperate, a dangerous situation and a madman who would ally himself with the Russians. We have no choice but to proceed with this undertaking. May God grant us success."

"That's that, then," the Secretary of State declared. "Let's get going!"

Later, Roosevelt recorded his conviction that "I was morally certain that almost half of those present, if they had felt free or had the courage to speak, would have opposed the undertaking."

Having convinced his superiors that AJAX could work, and having obtained the President's go-ahead, Kim Roosevelt's next task was to persuade the Shah to act. When Roosevelt entered Iran in mid-July 1953 he knew that he had fudged a bit before the Dulles brothers in outlining AJAX when he guaranteed that the Shah was prepared for decisive action. In fact, the Shah was hesitant, confused, fearful. The simplest, most direct way to buck him up would have been for Roosevelt himself to go directly to the palace, but the Dulles brothers were determined to keep AJAX a clandestine operation. Foster Dulles did not want the American role revealed under any circumstances.

Roosevelt had therefore set up his command post in the basement of a "safe house" in Teheran, but there could be no coup if the Shah was afraid to act, and in early August he was wavering more than ever. At this juncture, General Schwarzkopf* appeared in Iran, "armed with a diplomatic passport and a couple of large bags" containing "millions of dollars." (Kim Roosevelt

denies this figure; he claims there was only \$1 million, and only \$100,000 actually spent. Allen Dulles, after his retirement in 1962, said on a CBS television show that "the statement that we spent many dollars [in this operation] is utterly false.")

Schwarzkopf requested and was granted an audience with the Shah. But H.I.M., fearing spies in his own palace, was cautious, and Schwarzkopf's reassurances of Western support were not convincing. Meanwhile the Tudeh Party newspapers had learned of Schwarzkopf's presence. In special editions, they loudly denounced H.I.M. for his contacts with "brainless agents of international reaction." Mossadegh was furious. He threatened to hold another referendum, this time to depose the Shah. The crisis was at hand.

Obviously, Schwarzkopf had to get out of the country fast. Before leaving, he met with Roosevelt. "Kim," he said, "you simply are not going to be able to deal with the Shahanshah through any intermediary. I'm convinced that you will have to meet with H.I.M. personally." Roosevelt agreed emphatically. That night he made the first in his series of clandestine visits to the palace, where he managed to convince the Shah.

August 10, 1953. *Prime Minister Mossadegh postpones prohibition for one year, and the New York Times reports that "wine jugs all over this land of Omar Khayyam [are] tilted today in celebration." Prohibition was voted in by the Majlis a few months earlier, but Mossadegh has since then dissolved the Majlis and now, in a bid for popular support, Mossadegh—a teetotaler—overrides the law.*

For Kim Roosevelt, hiding in his safe house, the big news was not the delay of prohibition, but rather the distressing word that the Shah had fled his capital. H.I.M. had lost his nerve. Together with his queen, he had flown off to his summer palace on the Caspian Sea—without signing the decree.

Roosevelt, double-crossed and furious, consulted with his two Iranian agents. He sent them to Colonel Nematollah Nassiry; they bullied Nassiry into flying to the Caspian with the royal decrees and instructions to make sure the Shah signed them. Nassiry got there safely and managed to convince the Shah, but then the weather closed in and he was unable to fly back to Teheran.

At midnight, August 12, Colonel Nassiry returned with the signed documents. But they could not be delivered for two days because the Iranian weekend had begun.

Mossadegh, meanwhile, had learned of the decrees. So, when Colonel Nassiry appeared in the middle of the night of August 14-15 before the Prime Minister's home on Takht-i-Jamshid, a few blocks west of the American Embassy, he found it surrounded by American-made tanks, guarded by troops who were

* Schwarzkopf was a former New Jersey State Policeman who had gained wide recognition for his work on the Lindbergh kidnapping case. In 1942, as a U.S. Army colonel, he'd been loaned to Iran to help reorganize its police force. He had done that, turning it into a modern, efficient force loyal to the Shah, who came to depend strongly on him. In 1948, Schwarzkopf was promoted to brigadier general and left Iran for a new post in West Germany.

obeying orders from General Tazhi Riahi, the Iranian chief of staff and a Mossadegh loyalist. The troops had been instructed to keep Nassiry away, but he strode forward boldly in full uniform, correctly confident that the troops who were so accustomed to respecting his authority could not bring themselves to shoot him down. Nassiry demanded access to Mossadegh. This was refused. He then demanded a receipt for the delivery of the royal decree. This was refused. Nassiry would not leave without a receipt. Finally, after an hour and a half wait, he got a receipt signed by a servant. The delay, however, was fatal—before Nassiry could withdraw, General Riahi had him arrested and brought to his office. Riahi stripped him of his uniform and put him behind bars.

The next morning at 7 A.M. Mossadegh made a radio broadcast. He announced that the Shah, encouraged by “foreign elements,” had attempted a coup d’etat, and that he—Mossadegh—was therefore compelled to take all power unto himself. He sent out orders to arrest every known supporter of the Shah in Teheran. General Riahi’s troops started turning the city upside down looking for General Zahedi, whom Mossadegh denounced as a traitor.

They could not find Zahedi because Kim Roosevelt had taken him to a safe house near the American Embassy, a place with a big basement and surrounded by a high wall. From that spot, Zahedi began making his own radio broadcasts, claiming that he was the rightful Prime Minister, by decree of the Shah, and that Mossadegh was the real traitor.

At this juncture, the Shah fled Iran, with Queen Soraya, one aide, and the pilot of his Beechcraft. They had no luggage and no passports. They flew to Baghdad, where the Iraqi Government agreed to allow them to stay for a day.

In Teheran, meanwhile, the Tudeh hit the streets. Mobs swelled, chanted “Down with the Shah,” “Death to the Americans,” “Yankes, go home!” They surged up and down the streets, smashed statues of the Shah and his father, and joyfully looted everything they could grab.

The riots went on for two days. The Shah flew to Rome. Allen Dulles hopped a plane to Rome to confer with him. Foster Dulles, after consulting with Ike, told Loy Henderson (who had been on “vacation” as a part of the AJAX cover plan) to return to Teheran to see what he could do there.

Henderson’s return proved to be the decisive stroke. He arrived on August 18. Kim Roosevelt, again huddled on the back seat under a blanket, made his way by car to the embassy to consult. He suggested that Henderson see Mossadegh, complain about harassment to Americans, and threaten to pull all American citizens out of the country if it did not stop.

Henderson demanded and got an immediate audience with Mossadegh. The Prime Minister launched into a condemnation of the U.S. Government. He said that CIA agents had persuaded the Shah to issue the royal decrees, which he shouted were illegal, as only Parliament could remove him from office.

Henderson, brushing all the complaints aside, said he had come to talk about the presence of American citizens in Teheran. The Tudeh mobs were a threat to their lives and safety. In an interview years later, Henderson recalled, “I told the Prime Minister that unless the Iranian police were prepared to stop Com-

munist pillaging and attacks, it would be my duty to order all Americans to leave the country at once.”

Now it was old Mossy’s turn to lose his nerve. He begged Henderson not to do it. An American evacuation would look just terrible, make it appear that his government was not able to govern.

Mossadegh called in an aide and asked if it were true that the Tudeh people were roaming the streets in gangs, pillaging, destroying, and attacking foreigners. When the aide said it certainly was true, Henderson said, “In my presence Mossadegh picked up the telephone, called the Chief of Police, and gave orders that the police be instructed immediately to restore order to the streets, to break up roving gangs who were engaging in violence.”

It was the old man’s fatal mistake. The Schwarzkopf-trained police, previously under orders not to take steps that might offend the Tudeh, were delighted to be turned loose. New York Times reporter Kennett Love wrote, “Policemen and soldiers swung into action tonight against rioting Tudeh partisans and Nationalist extremists. The troops appeared to be in a frenzy as they smashed into the rioters with clubbed rifles and nightsticks, and hurled tear-gas bombs.”

The following morning, August 19, Kim Roosevelt sprang into action. The pro-Mossadegh forces were off the streets, the day was already hot, the atmosphere oppressive. Roosevelt gave his two Iranian agents the orders to strike. He had earlier described these agents to the Shah: “They are extremely competent, professional ‘organizers.’ They have a strong team under them, they can distribute pamphlets, organize mobs, keep track of the opposition—you name it, they’ll do it.” Roosevelt also told the Shah, “We have a gigantic safe next to my principal assistant’s office. This safe is jam-packed with *rial* notes. . . . We have the equivalent of about one million dollars in that safe.”

That was the money Schwarzkopf had brought in from the CIA. Roosevelt’s Iranian agents now began to buy themselves a mob.

They started with the Zirkaneh giants, weight-lifters who developed their physiques through an ancient Iranian set of exercises which included lifting progressively heavier weights. The Zirkanehs had built up tremendous shoulders and huge biceps. Shuffling down the street together, they were a frightening spectacle. Two hundred or so of these weight-lifters began the day by marching through the bazaar, shouting “Long live the Shah!” and dancing and twirling like dervishes. Along the edges of the crowd, men were passing out ten-rial notes adorned with a handsome portrait of H.I.M. The mob swelled; the chant “Long live the Shah!” was deafening. As the throng passed the offices of a pro-Mossadegh newspaper, men smashed the windows and sacked the place.

“Do you think the time has come to turn General Zahedi loose to lead the crowd?” one of Roosevelt’s assistants asked him.

Not yet, he replied. “There is nothing to be gained by rushing. Let’s wait till the crowd gets to Mossadegh’s house. That should be a good moment for our hero to make his appearance.”

Roosevelt’s radio operator appeared, tears streaming down his face. He had a message from Bedell Smith, a message Smith

had sent twenty-four hours earlier, but which the British on Cyprus had held up for a day. The message said, in effect, "Give up and get out."

With a hearty laugh, Roosevelt jotted down a reply for the radio operator to send back to Cyprus: "Yours of 18 August received. Happy to report Zahedi safely installed and Shah will be returning to Teheran in triumph shortly. Love and kisses from all the team."

With that, Roosevelt left his basement hideout and went out into the streets. He was on his way to pick up Zahedi. He ran into General Guilanshah, chief of the Air Force, in full uniform. Guilanshah recognized Roosevelt and eagerly offered to help. Roosevelt told him to pick up a tank. Guilanshah asked where Zahedi was, and Roosevelt gave him the address.

Arriving at Zahedi's hiding place, Roosevelt found the Prime Minister-designate in the cellar, wearing only his winter underwear. In broken German, Roosevelt told him to get dressed. The general put on his full-dress uniform. As he buttoned his tunic, Guilanshah burst into the room. He had a tank waiting outside.

In telling the story years later, CIA agents embellished it until a myth developed that Kim Roosevelt, in the grand tradition of his Rough Rider grandfather, had mounted the lead tank and led the way to Mossadegh's home. In fact, he stayed out of sight. Zahedi led the mob, supported by tanks rounded up by Colonel Nassiry and General Guilanshah. According to *Times* reporter Love, the two-hour battle that raged outside Mossadegh's home was fought between those soldiers loyal to Mossadegh and acting under General Riahi's orders, and troops following Zahedi. One hundred were killed, three hundred injured. Zahedi's forces prevailed, as Riahi's men ran out of ammunition.

At dusk, Royalist troops overwhelmed the remaining household guard and entered Mossadegh's home. The old man was gone—he had slipped out the back way.

The Shah received the news the next day while he was lunching at his hotel in Rome. The *Times* reported that "he went pale and his hands shook so violently that he hardly was able to read when newspaper men showed him the first reports. 'Can it be true?' he asked. The Queen was far more calm. 'How exciting,' she exclaimed, placing her hand on the Shah's arm to steady him."

A little later, at a press interview, the Shah declared, "It shows how the people stand. Ninety-nine percent of the population is for me. I knew it all the time."

That same day, August 20, Mossadegh, tears streaming down his face, his nose dripping, leaning heavily on his cane, dressed only in pink pajamas, accepted his fate and surrendered to Zahedi.

H.I.M. decided to return. After such a touching display of affection and loyalty from his subjects, how could he do otherwise? On Saturday, August 22, His Imperial Majesty, the Shahanshah, Mohammed Reza Shah Pahlavi, Light of the Aryans, returned in

triumph to his capital. Prime Minister Zahedi, all members of the new Cabinet, the entire diplomatic corps, "and mobs of deliriously happy citizens from all ranks of life" (at least according to Kim Roosevelt) were at the airport to greet him.

A few days later, Roosevelt reported in Washington to the Dulles brothers, Secretary of Defense Wilson, Admiral Arthur Radford, and General Andrew Goodpaster. In the best CIA fashion, he had an easel, maps, a chart, the works. He went into great detail. His audience, he later wrote, "seemed almost alarmingly enthusiastic. John Foster Dulles was leaning back in his chair. . . . His eyes were gleaming; he seemed to be purring like a giant cat."

Eisenhower was on vacation in Colorado when Kim Roosevelt returned. He was careful not to meet with Roosevelt or have any direct connection with AJAX. In his memoirs Ike did quote a portion of Roosevelt's report, but only that part that dealt with the aftermath ("The Shah is a new man. For the first time, he believes in himself. . ." etc.), and he stated flatly that the report was prepared by "an American in Iran, unidentified to me."

The reckoning in Iran went as follows: Mossadegh was tried, found guilty of treason, and sentenced to three years solitary confinement. Colonel Nassiry became Brigadier General Nassiry. Prime Minister Zahedi reestablished diplomatic relations with the British. An international consortium of Western oil companies signed a twenty-five-year pact with Iran for its oil. The old Anglo-Persian Oil Company got 40 percent, Royal Dutch Shell got 14 percent, the Compagnie Française des Pétroles got 6 percent, and the Americans (Gulf, Standard of New Jersey, Texaco, and Socony-Mobil) got 40 percent. Under a special ruling by the Department of Justice, the American oil companies participated in the consortium without fear of prosecution under the antitrust laws.

So the British had failed to stop the inevitable—they lost their monopoly—while the Americans had managed to prevent the improbable, a Communist takeover in Iran.

In September 1953, President Eisenhower announced an immediate allocation of \$45 million in emergency economic aid to Iran, with another \$40 million to follow. On October 8, Ike wrote in his diary, "Now if the British will be conciliatory . . . if the Shah and his new premier, General Zahedi, will be only a little bit flexible, and the United States will stand by to help both financially and with wise counsel, we may really give a serious defeat to Russian intentions and plans in that area."

"Of course, it will not be so easy for the Iranian economy to be restored, even if her refineries again begin to operate. This is due to the fact that during the long period of shutdown of her oil fields, world buyers have gone to other sources of supply. . . . Iran really has no ready market for her vast oil production. However, this is a problem that we should be able to help solve." □

A Whole New Way to Cram

By Mark Larsen '80
Director of Promotion

What do you do with five tons of food? Package and deliver it to 1,391 students, that's what. This happened during spring exam week as a project of the Wisconsin Alumni Student Board, our newest addition to student relations.

Last February, the board wrote to the parents of all dorm students on campus, announcing the sale of the *Final Exam Survival Kit*—a large package of assorted foods to be delivered with a special encouraging note from the family. "We never guessed how popular the idea would be," said Jim McConnell, a senior from Beloit and the board member in charge of the project. "We got twice the orders we'd planned on."

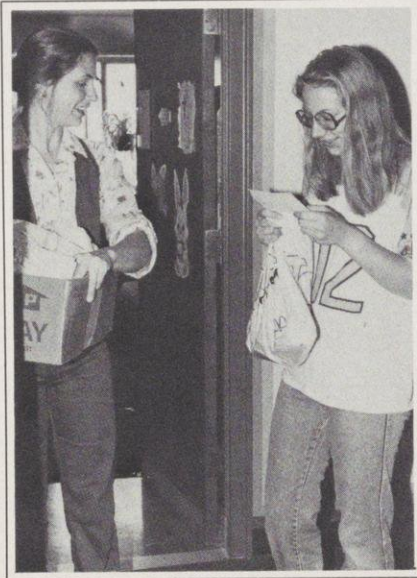
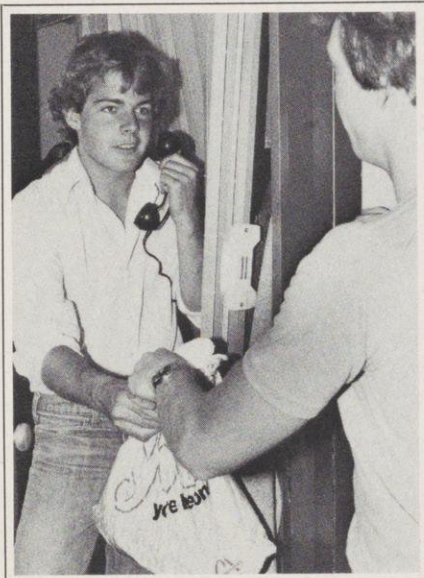
On Friday, May 1, the five tons of food arrived at the Field House. In three hours the board members had filled 1,400 kits with: apples, Granola Bars, M&Ms, Oreo Cookies, packaged cheese-and crackers, gum, almonds, Hershey Bars, raisins, V-8 Juice, Caramel Corn, lemonade mix, brownies, mints, pencils and ballpoints, and freebie-breakfast coupons from McDonalds. One of everything went into each plastic drawstring bag, also from McDonalds. On Sunday and Monday they were delivered to twenty residence halls. Most came as a surprise to their battle-weary recipients who beamed at this special remembrance from home. □



The assembly line in the Field House was, clockwise from front: Jim Siebers, Kay Karow, Judy Tangney, Gerry Suennen, Pete Hall, Jim McConnell (throwing box), staffer Mark Larsen and Katie Quirk.



On Sunday and Monday the volunteers delivered the Survival Kits to residents of twenty campus dorms. Here, Margie Rzeszut and Jim Hunter head into the Southeast Dorms with the first of several cartons.



Hunter and Karen Bruett were among the Alumni Student Board members who made the rounds of designated dorm rooms to deliver the goods. Nearly 1,200 were presented directly to the students; those who weren't home were left notices to pick up their kits at Alumni House. The project raised close to \$3,600 for other student-related programs this fall.

Photos/Cary Smith

University News

Graduation, Honorary Degrees

Some 4,200 were eligible to receive degrees at spring commencement on May 17. Of these, 2,700 earned bachelor's degrees. 815 earned master's, 250 doctor's, 305 in law and 130 in medicine.

Honorary degrees went to Germaine Bree, retired professor of humanities; Nicholas G.L. Hammond, British authority on ancient Greece; Benjamin Quarles MA'33, Ph.D.'40, a pioneer in Afro-American history; Dennis W. Watson Ph.D.'41, chairman of the microbiology department at the University of Minnesota; and Robert W. Wentorf Jr. '48, Ph.D.'50, a physical chemist with General Electric.

Later in the day, thirty-five Army, Navy and Air Force ROTC graduates were commissioned.

The last day for classes was May 8, with final exams running May 10-16.

Grads' Job Picture Is As Good As Last Year

A year ago the job opportunities for spring graduates had improved, and this year was more of the same, says a survey conducted by the University News Service. Engineering and business majors were still outnumbered by recruiters; education grads found the situation even more hopeful than last year, and the best prospects in L&S fell to those who'd studied computer science.

The twin hallmarks of today's economy—a recession in major purchases and a slowdown in government spending—have struck at several hiring areas, campus counselors said. "Civil engineers are having a few problems because of government cutbacks and the slowdown in construction," said Prof. James A. Marks, director of the placement office for the College of Engineering. But they're about the only ones in that discipline who are. "There's really just a handful of engineers who hadn't found quite what they wanted at graduation time, and at salaries between \$22,000 and \$23,000 a year," Marks said. Those salaries were up at least 10 percent over last year, with chemical engineering pushing the top at \$25,000 for a new grad. Master's degree recipients got \$27,000-plus, and doctoral candidates asked for and received more than \$30,000. The reason is the technolog-

ical race plus the prospect for increased defense spending.

Marks added that about two-thirds of this year's 900 engineering grads planned to settle in Wisconsin or within 200 miles of its borders. To woo them, about 600 companies sent recruiters to campus last fall, and another 500 were here this spring.

In the School of Business, placement director Karen K. Stauffacher said job offers were up 30 percent over last year. Her office coordinated more than 4,000 interviews during the years for the 220 MBA and 325 bachelor's degree students. MBA grads were being offered an average of \$22,800, a 13.5-percent rise over last year. Bachelor's degree candidates were offered an average of \$17,700, up 15 percent.

Patricia K. Fessenden, assistant director of the campus Career Advising and Placement Center, said that firms looked harder at L&S grads in economics and mathematics who can apply computer techniques to company needs. In addition, jobs are plentiful in computer science itself, as well as in industrial relations and retailing—the latter stronger in the Midwest than on the East Coast. She has noted a growing stress by business on work experience; on internships or jobs held during University years, and in leadership potential. Students show an increased willingness to attack the job-hunt on a more professional basis. The office established an overnight resumé-critiquing service for those who could not schedule a regular appointment.

Job-seekers in the College of Agriculture and Life Sciences found fewer openings in natural resources and agricultural construction, said Assistant Dean Richard Daluge, although ag construction activity is picking up in the Southwest and East. The job market in agriculture itself is tighter than it's been in the last couple of years, Daluge said, but it's still promising, "especially for those with summer-job experience." Yet, "the number of recruiters this spring was the best it's ever been, although they were more selective; instead of hiring three or four, they hired one or two."

Because agriculture is such a diverse field—with majors ranging from journalism to engineering—Daluge found it hard to draw a consistent average for the college. He said the demand is "still very strong for those with farm backgrounds, in a specialized kind of major such as food science, food engineering and ag engineering." Starting salaries ranged from \$11,000 to

\$24,000, with the master's degree job market better than that of the bachelor's.

Campus Scientists Make Breakthrough on TSS

In its May 9 issue the British medical journal, *The Lancet*, reported that a team of UW scientists, headed by Prof. Merlin Bergdoll of the food microbiology and toxicology department, has traced the probable cause of toxic shock syndrome (TSS), the newly recognized, sometimes-fatal disease associated with tampon use. That cause appears to be a previously unknown enterotoxin produced by specific staphylococci. Strains of the species *Staphylococcus aureus* have long been known to produce enterotoxins and to cause infections. (Staphylococci-produced enterotoxins—poisons of the intestinal lining—are the primary causation of food poisoning.) When UW scientists realized that the signs and symptoms of TSS were similar to those caused by then-known enterotoxins, they began examining staph cultures from TSS patients and discovered that ninety-five of ninety-nine identified cases of *S. aureus* did indeed produce an enterotoxin, but one different from any observed in previous research. Bergdoll named it "enterotoxin F" (the others were A through E).

Now studying the "new" enterotoxin, Bergdoll expects to find its properties similar to those of enterotoxins A-E and of TSS. He has found evidence, too, that some women are more immune to enterotoxin F than others. One implication of this discovery is that, with further research, a simple blood test might identify those especially prone to the disease.

The researchers cannot explain the connection between TSS and staphylococci-produced enterotoxin F, nor why TSS has appeared only recently, nor its association with tampons.

Members of Bergdoll's team are microbiologist Barbara Crass '78; biochemist Raoul Reisler and immunologist Ruth Robbins. Cooperating with them are Jeffrey P. Davis '67, MD, an epidemiologist with the state Department of Health and Social Services; Philip Wand, a bacteriologist with the state Laboratory of Hygiene and Joan Chesney MD of our Center for Health Sciences.

Eight Faculty Named 'Distinguished' Teachers

The faculty selected eight of its members as recipients of the annual Distinguished Teaching Awards for 1981. The choice each year is based on lengthy documentation of teaching excellence and supporting letters from past or present students.

Each winner receives a check for \$1000 from the fund for which his particular award is named. This year's honorees are: Professors Robert Baker, English; Gwang-tsai (Arthur) Chen, East Asian languages and literature; Ray F. Evert, botany; Raphael A. Finkel, computer sciences; Martha M. Howe, bacteriology; Robert G. Kauffman, meat and animal science; David C. Lindberg, history of science; and Glenn A. Sather, chemical engineering.

Prof. Kauffman won the first annual teaching award to be sponsored by the Wisconsin Alumni Association. (See page 20).

Prof. Finkel, 29, was the forty-fourth recipient of the Kiekhofer Award, established in 1951. He has been on the computer science faculty since 1976, and last year earned a Sperry Univac citation as Computer Professor of the Year.

Prof. Evert, 50, on the botany/plant pathology faculty since 1960, was given the Steiger Award. He has been a Guggenheim Foundation fellow and an Alexander von Humboldt awardee.

Prof. Howe, 35, has been on the faculty of the bacteriology department for six years following her reception of the American Cancer Society Postdoctoral Fellowship. Her DTA award this year is supported by Amoco, as are two others.

They go to Prof. Lindberg, 45, on the history of science faculty since 1967, where he has served as director of graduate studies and chairman; and Prof. Sather, 53. He has earned the chemical engineering department's Polygon Outstanding Teacher Award three times since joining the faculty in 1959.

Chancellor's Awards went to Profs. Baker and Chen. Baker, 41, has been in the English department since 1972 where he has won a number of fellowships and has served on several committees.

Chen, 43, joined the East Asian languages and literature department when he earned his doctorate there in 1972. The ba-

Continued



Photo/Gary Smith

1981-82 OFFICERS. The new executive committee posed after its election on Alumni Weekend in May. Here they are, with their elected positions (addresses are on the masthead on page 3). Front row, from left; Eric Hagerup '58, first vice-president; Ann Healy Allen '68 (re-elected) assistant secretary; Jon Pellegrin '67, second vice-president; Al DeSimone '41, third vice-president, and Don Frank '47, treasurer. In rear: Betty Erickson Vaughn '48, chairman; Clare Rice '43, president, and Karla Geiger Snively '48, secretary. They were elected by the Board of Directors at its bi-annual meeting, and took office the first of July.

LOOKING FOR A WISE INVESTMENT?

Consider A Life Income Arrangement With The University of Wisconsin Foundation

Each year for the past six years, friends and alumni of the University of Wisconsin have been making life income arrangements with the University of Wisconsin Foundation by joining the Foundation's pooled income fund. They often achieve two purposes by this arrangement: make a donation to a most worthy cause—the University of Wisconsin—and save taxes and increase their spendable income.

To learn how the pooled income fund works, consider the true facts of the case of Bill and Betty Smith (their names have been changed to respect the confidentiality of their gift).

Years ago, Bill and Betty Smith invested in 100 shares of Lakeside Laboratories, Inc. common stock. It cost them \$6.87 per share then. Through merger, Lakeside converted to Colgate-Palmolive, and the 100 shares of Lakeside by means of bonus payments and stock splits eventually became 696 shares of Colgate-Palmolive stock.

Recently, Bill and Betty made a wise investment that **increased** their income from this stock by joining the UW Foundation's pooled income fund. The fund will pay them an annual income as long as either of them lives.

On July 30, 1976, they donated 488 shares of Colgate-Palmolive stock to the fund. On that day the stock's mean value was \$27.63. The gift at fair market value amounted to \$13,481, with a total appreciation of \$12,794. The stock had a dividend rate of 3.2 percent, compared with the pooled income fund earnings of 7.23 percent in 1976.

By donating the stock instead of selling it, the Smiths saved over \$3000 in capital gains taxes, received an immediate tax deduction of \$6,730.52 based on Treasury Tables and the fair market value of the gift on the day it was donated, and **increased** their income by approximately 4 percent over their previous income from the stock.

The Smiths did something else by this gift. They began the "Bill and Betty Smith Fund" for the UW-Madison College of Engineering. When both Bill and Betty die, the assets in the pooled fund are turned over to the College and will provide the University with much needed financial support and assist it in its constant mission of creating a better world.

Bill and Betty Smith have made a wise investment in every way.

For further information, contact:
Timothy A. Reilly
Associate Director
University of Wisconsin Foundation
702 Langdon Street
Madison, Wisconsin 53706
Phone: 608/263-4545

sic Chinese course sequence which he established here is rated as one of the top programs in the country.

One Quarter of New Faculty are Women

More than one-fourth of new faculty members hired during the past year were women, and nearly one-tenth were members of minority groups, according to figures compiled by the campus affirmative action office.

Of 104 hired as instructors, assistant, associate, or full professors, thirty were women and ten were minority group members. Affirmative action director Diane Rausch said the percentage of minorities hired is the highest since at least 1975. Minority hiring has varied between 5.7 percent and almost 8 percent during the past six years, except during the 1978-79 reporting year when it fell to just under 2 percent.

Hiring of women faculty members has remained fairly constant, Rausch added. Four of the ten minority faculty members hired were women. For reporting purposes minority women are counted in both categories.

The figures represent all faculty hired from November 1979 through October 1980.

Off-Campus Rents Higher For Summer, Fall Students

Not surprisingly, off-campus housing costs up to 23 percent more this summer and fall than it did a year ago, according to a rent study by the Campus Assistance Center. The late-spring survey of about 650 campus-area apartments showed an average 17-percent hike in rents, said center director Steven Saffian. The center maintains, for student rental, listings of apartments located mainly in the city's isthmus area.

Students who paid an average of \$240 for a one-bedroom furnished apartment last year expected to pay \$282 for a similar apartment this summer, according to the study. That represents a 17.5-percent increase. A two-bedroom unit which went for \$350 last year now costs \$394. Rent for a three-bedroom apartment is \$541 this year compared with \$440 last year, or 23 percent more. Multi-bedroom houses and unfurnished apartments had less severe rent increases, according to the survey.

**American Indian Law Grads
Set University Record**

Thirty-three American Indians graduated from the nation's law schools this spring, and nearly one fourth of them were from ours. The eight Native Americans who received their JDs here comprised the largest group in UW history and the second largest in the nation. (The University of New Mexico once graduated nine.)

Douglas Endreson '78 gave the keynote address at a dinner held in their honor by the Native American Studies Program. Endreson, a clerk for State Supreme Court Justice Shirley Abrahamson, will soon join the Native American Rights Fund in Colorado.

The new graduates are: Henry Buffalo, a Chippewa-Oneida from Wisconsin's Red Cliff Band, who will become its tribal attorney; John Beudin, a Lac Court Oreilles Chippewa, who will work for Judicare in Wausau; Mary Corbin, a Menominee, continuing advanced studies here; Robert Kittecon, a Menominee, who will join Northeast Minnesota Legal Services in Duluth; Robert Gardner, a Kiowa, going to Lawton, Oklahoma to work for a legal services corporation; William Gardner, a Kiowa also headed to Oklahoma, to Clinton and a job at the Cheyenne-Arapaho legal assistance project; John Kinstedt, an Oneida-Chippewa, undecided; and Andrew Pyatskowitz, a Menominee, who plans to practice in Green Bay.

**Symposium Marks Geology
Centennial
And Weeks Hall Dedication**

The geology and geophysics department hosted an international symposium in May to formally mark the centennial of geological study at the University and the dedication of Lewis G. Weeks Hall, 1215 W. Dayton St., home of the department. It focused on the Proterozoic period, considered one of the most critical in the evolution of the earth. The period, lasting from approximately 2,500 million years ago to 600 million years ago, has drawn increasing attention among geologists in recent years because it was during the Proterozoic, many say, that the earth was changing into its present state. The department has been active in exploration of the Proterozoic geology of the Lake Superior region. It plans to publish two volumes from the symposium, including one on Proterozoic geology of the Lake Superior region.

Weeks Hall was completed in 1980 at a total cost of \$5.6 million, more than \$3 million of which was contributed by the late geologist Lewis G. Weeks, a 1917 graduate of the department.

Continued

Football Bash for Young Alumni

Classes of 1966-81

Featuring 1980 Madison Olympians

**September 12 at Union
South
Season opener against
Michigan**

10:30—
Hear a panel of Madison
Olympians discuss the 1980
Olympics

11:30—
Social Hour—Cash Bar

12:00
Luncheon

12:25
The traditional UW Band
Concert on the terrace

1:30
A special seating bloc for
the Wisconsin-Michigan
game.

\$15.50 per person
(Program and luncheon only, **\$5.50**)
Seating-bloc tickets available only
to those attending entire program

**Reservation deadline
September 1**

Wisconsin Alumni Association
650 N. Lake Street
Madison, 53706

Enclosed is my check for \$ _____
(check payable to Wisconsin Alumni Association) for _____ reservations (____ at \$15.50; ____ at \$5.50) for the Young Alumni Football Bash on September 12 against Michigan.

Name _____ Class Year _____

Address _____

City, State, Zip _____

Guest(s) _____

Prof. Bob Kauffman

*Designated recipient of WAA's
1981 Distinguished Teaching Award.*

This year the Wisconsin Alumni Association joined the list of sponsors of the campus Distinguished Teaching Awards. When the faculty announced its selection of eight winners (p. 17), Prof. Bob Kauffman was designated our honoree.

Robert G. Kauffman MS'58, Ph.D.'61 is on the faculty of the Meat and Animal Science department, his subjects being meat science and muscle biology. And although this was Bob's first downright official all-University DTA, it's his fourth such title since he joined the faculty in 1966. The ag faculty gave him one in 1970, and meat science associations repeated it in '72 and '77. Then, last year he was named a Danforth Associate, which is national recognition for excellence in "the humane dimension" in teaching.

In his office—which is long, narrow and monastic—at the end of the hall in the Muscle Biology Laboratory just west of the Stock Pavillion, Kauffman talked about teaching.

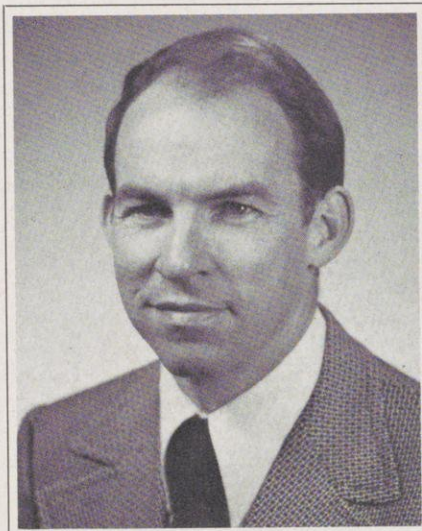
"Most who get Ph.D.s do it because they're interested in research, so they have to do a lot of self-motivating to get up there and teach. But I'm one of the fortunate minority who got one just so I can teach. It's wonderful to be a teacher because you want to teach.

"I'm far from an elegant lecturer, and I'm strong on emphasizing the basics. I expect them to know how to communicate, and to understand math and chemistry."

In a department of 175 enrolled majors and twenty-five faculty, Bob "helps with" a freshman course by teaching a few weeks of introductory lab work; teaches the sophomore "Growth, Composition and Evaluation of Market Animals," and runs a unique twelve-student senior course on livestock commodities and futures trading. It's an investment seminar—borrowed freely from the School of Business—in which the students face the market. (From time to time they do so with cold hard cash in their hands, but "that can get to be pretty expensive, and I can think of so many other places we can use those funds around here"). Kauffman also supervises six grad students on their theses, and lectures occasionally on the grad level.

"I believe it's a shame," he said, "for a teacher to get up and give a canned 'cook-book' kind of lecture. Some of my students think I'm terribly disorganized at times because they can't take notes from me, but I

don't want them to have to take too many notes. That means a teacher isn't being very effective. I want them to listen and get some ideas. The classroom is the place to work out the points they didn't understand when they were reading the material. Once, as a guest lecturer in food science, I wrote out my lecture and gave it to the students a week in advance. I told them my 'lecture' would be in the form of answering their questions, and that if they didn't have



Prof. Robert G. Kauffman

any, we'd have a one-hour exam instead. I got a full hour's worth of good, sharp questions!

"I think a teacher insults the students' intelligence to stand there and talk and talk. He or she is there to bridge the gap over what they don't understand.

"Actually, I do a lot of my teaching through my exams. Most students say they don't know how to study for them even though I keep all the old ones on file. But, very rarely do I give a question such as 'list the five things—,' or 'name the parts of—.' Instead, I may give them fifteen or twenty words and have them put them into a paragraph in the correct perspective. One time I handed out a blank sheet of paper for an hour exam and told them to make up four intelligent questions and then answer them. Would you believe some of them screwed-up their own questions! The curve wasn't any higher on that one than on any other exam."

A few years back, and over a period of

more than two years, Kauffman worked with a veterinarian and developed a picture text that is a self-teaching guide to the anatomy of pork and sheep. It was the first of its kind, elementary as the need may seem. It is now used widely, including as a basis for a three-week segment for the meat science introductory course here. After those three weeks the students know all 100 muscles, the fat depots, the bones of the animal body. Kauffman is proud of that book.

But he's prouder still of "two things I've done which have sparked educational programs.

"One is our Meat-Animal Evaluation Program that I helped start in 1963 (as a grad student). Now it's become an annual contest held in Omaha.

"The other is our Academic Quadrathlon, designed by chance, as a lot of things happen. It's a no-credit competition we hold every year, usually in February, and it involves all of the faculty in the four divisions—poultry, veterinary science, dairy and meat and animal science. These teachers get together to form committees and become officials. Then, all the juniors and seniors in those four areas get together for this series of exams on everything they've learned here. For a couple of nights, over in the Stock Pavillion, we have this four-part competition. One part is a public presentation; we give them a topic and an hour or so to head over to the library to brush up. Then they come back and give a public presentation on it. Then, there's a bowl-game section, with teams being quizzed like they are on 'College Bowl.' Then there's a written exam, and finally a laboratory practicum. You see, they all pool their knowledge. Some of the stuff they might have to do is identify different kinds of hay. Or put together a milking machine. Or ear-notch, castrate and vaccinate baby pigs, or bone a ham. The winning team goes to the Animal Science meeting in Omaha free of charge.

"The students like this kind of thing because it's practical. They like it, too, when I schedule a conference call instead of a lecture or lab. We get to some leader in the meat industry, and we sit around a table and ask him or her questions and get all that practical knowledge. We can talk for an hour for eight bucks.

"That's the kind of thing that excites our students. And when they're excited, I'm excited."

—T.H.M.

Continued

Prof. Tanner Elected to Nat. Academy of Sciences

Prof. Champ B. Tanner Ph.D.'50, of soil science and meteorology, has been elected to membership in the prestigious National Academy of Sciences.

He has been on the faculty since 1951, with research centered around soil physics, micrometeorology and plant environment, and a major interest in crop water use and plant-water relations.

A full professor since 1960, Tanner was named two years ago as the Emil Truog Professor of Soil Science, a lifetime research appointment made by the Board of Regents.

Club Programs

Each club sends mailings to members with complete information.

Chicago: September 11—Club season kickoff cocktail reception at the University Club of Chicago, 76 E. Monroe. Cash bar. 5—7 p.m. Info., Steve Sills, (office) 621-2259.

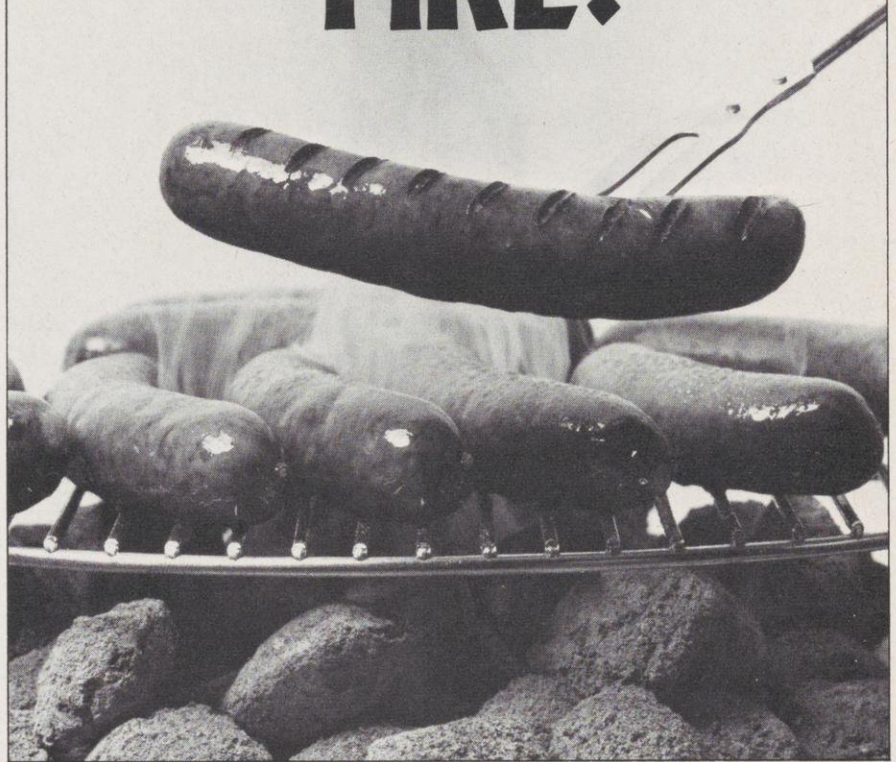
Eau Claire: September 19—Football trip to Madison for UCLA game. \$33 for bus, game ticket, beer, box lunch, dinner in Dells. Res., Jack Bartingale, P.O. Box 882, Eau Claire 54701.

New York City: September 16—Beer-and-brat party, 6-8:30 p.m., AAUW headquarters, 111 E. 37th St. between Park and Lexington avenues. Price not yet established. For that information and to make reservations, write UW Alumni Club of New York, P.O. Box 1257, Grand Central Station 10017.

In October the club will sponsor a Big Ten Cocktail Party. Further information from the above address.

Washington, D.C.: August 2—Evening at Wolf Trap. Picnic, 5:30 (beer and soft drinks supplied), lawn tickets for "Student Prince," \$7.50. Info., Austin Henry—322-3797; or Jeanne Matoba—244-0858.

LIGHT YOUR FIRE!



There's just one taste that compares with the flavor of sizzling and juicy brats hot off the iron bars of the Brathaus restaurant's grill—real Brathaus brats *at home*. On your grill

For picnics, parties or backyard cookouts, either right out of the box or simmered in beer, butter and onions, there's no better brat. And there's no better way to get them than vacuum-packed, UPS-delivered in an 8 pound box (about 40 sausages). For only \$25 per box (incl. shipping).

So, clip the coupon, fill your Weber with briquettes and *light your fire!*

Please rush me _____
for \$ _____
Name _____
Address _____
City _____ State _____ Zip _____
Brathaus brats at home.TM
box(es) at \$25 each. Here's my check
Makes a nice gift, too.

The Brathaus
803 State Street
Madison, WI 53703

Keeper of the Keys

By Valeria Davis '81

This campus has over 60,000 doors. The job of keeping their locks working belongs to key-shop supervisor Edward Skroch. His name rhymes with "go," and he is a round-faced man with glasses and a non-committal expression which makes his warm smile come as a surprise. When Skroch was hired seven years ago he was the first professional locksmith to head the shop since it began part-time maintenance in 1930. He is a master locksmith with twenty-eight years' experience, certified since a 1968 exam before the Cook County Locksmith Board in Chicago. Preceding that were sixteen years as student, apprentice, journeyman and safe-and-vault technician, working with keys and lock-picking tools and planning industrial and institutional lock systems. It was the latter ability that put him on the University staff.

"Institutional locksmithing differs from domestic locksmithing," Skroch said. "Domestic work involves maybe five or ten keys. The system can be memorized, or a key added arbitrarily. But institutional locksmithing is more administrative; you can divide a building into specific sections in a numerical plan. We use a sectional key system which can have up to 4,000 pin combinations. It uses what are called 'progressive' submaster and master keys. A submaster can open a section of perhaps ten doors. Next comes a master key which 'passes' (fits) the submasters. It has a pin combination that can trip around sixty locks. Next is the *grandmaster* which, for example, opens all 400 doors in Vilas Hall, and finally the *great-grandmaster* for such complexes as University Hospitals.

"This kind of system creates a kind of access hierarchy. A lab assistant might have keys for three doors; the lab supervisor has a submaster for probably twenty doors; the department chairman will have a master for maybe sixty. Mass-access keys go to security personnel only, of course.

"A key can be cut and buffed in about two minutes, but then, at a place like this, it has to be checked against the written schedule. For the hospital complex, that schedule is around ninety pages long with at least a dozen combinations on each page. The hospital security staff has two locksmiths to maintain that system alone.

"We like to train our people from scratch. Domestic locksmiths have too

many bad habits. It's more important to us for them to understand the technicalities of the lock system than how to cut a key."

Skroch supervises three other locksmiths who work out of a basement shop at 1217 University Avenue, the Physical Plant office. They aren't particularly visible around the campus because they try to work on doors when the rooms aren't occupied. Lock cores can be removed and taken back to the shop for extensive repairs or pin changes. Groups of cores are replaced during any rekeying or lock-changing process.

"We're rekeying the Bacteriology Building to correlate the new wing. And we're rekeying the old hospital building on University Avenue, and South Hall. A lot of the keys to South Hall are missing because student employees graduate and leave without giving them back. You have to have better security because the equipment in a room today might be worth five times what it was ten years ago."

Skroch's staff put in heavy overtime a year ago during the Teaching Assistant Association strike. Campus police stepped-up night security on buildings but despite that, says Robert Lindsay, the associate Physical Plant director, they found large numbers of doors with glue squirted into their locks. It had to be removed with solvent. Skroch said, "We repair about 400 locks a year—mostly from attempts at forced entry—but that's not nearly as many as you would expect for a complex of this size."

His explanation of his work with locks relates to another subject, damage to buildings and windows, which is the concern of the department of protection and security. Vilas Hall, at University Avenue and Park Street, with its several access levels including the pedestrian bridge over University Avenue, is perhaps the bull's-eye for vandals. Its Parliamentary Room is exposed on four sides to the fourth-floor court. The outer walls are windows, draped. Inside, a sequence of locked

doors guards the plush auditorium with its bounty of audio-visual equipment. A window gets shattered only rarely, but Skroch said would-be thieves "break off a pair of solid steel door handles about every month. We have a standing order on them, but I only pay for two at a time—they cost \$52 apiece—or the accountants would kill me."

Door handles and knobs are a bane unto themselves for Skroch and his staff. "Around the University there are a lot of book-and-equipment carts, and they're heavy. When they run into a doorknob they can break it off. That's practically an everyday occurrence. We save all the parts because a new knob costs \$28. Every building has different hardware at different replacement costs. Architects are allowed to choose their hardware style, and of course they want the buildings to look nice. We must have every finish in the book, something like thirty types of door fixtures and finishes. Some have to be special-ordered. There are chrome-plated knobs in Helen C. White Library, stainless steel in Vilas Hall, solid bronze in the Humanities Building, and burned bronze in the new engineering labs.

"The worst hardware investment on campus was the black plastic knobs in Van Hise Hall; they're so easy to break. We replace a couple dozen a year. They've stopped making them, but you can still order replacements at \$9. We're replacing them with steel knobs with parts that cost more than \$30 each. I've been asking for years to order one standard lock in one standard finish with standard replacement parts. You can get them for \$13. But the hardware-choice policy is important to architects."

Pegboards filled with keys, and floor-to-ceiling shelves filled with keys—42,000 of them—line Skroch's office. There are over a dozen key-cutting machines. The shop operates on an \$85,000 annual budget; is supplied by about eight manufacturers; and cuts something like 12,000 keys a year.

"I carry fewer keys than anyone around here," Skroch said. He pulled a ring from his pocket. "This is the master to our house; this opens the side door to the building; and this is to the shop door. This opens my desk. That's all I need; the rest I leave here."

□

Valeria Davis, from Beloit, will graduate next December in Journalism. This summer she is in New York, interning at Women's Day magazine.

Come Along With Us...

On a northern adventure! We can go hiking, fishing, golfing, swimming or take pony rides and walks—all in the pristine setting of the Canadian Rockies. But the most exciting are the sights—a kaleidoscope of wildlife preserves, lakes, valleys, waterfalls, meadows, mountains. (And we can enjoy them while relaxing at the hotel and on the bus!)

We'll fly to Calgary, then go to Jasper National Park and a night at Lobstick Lodge. Next, to the Icefields Parkway where the mountainous roads offer magnificent vistas and a stop at the Columbia Icefields, a glacier remnant from the last Ice Age. Our destination, high in the Rockies, is a storybook castle, Chateau Lake Louise, where the emerald green lake and its colorful environs reveal a picture postcard come alive. Next we'll journey to Banff National Park, famous for its natural hot mineral springs, for a three-night stay in the Banff Springs Hotel. Then back to Calgary for a night at the charming Palliser Hotel before returning to Chicago via Air Canada.

American breakfasts and dinners at hotels (except Calgary) are included; two luncheons are provided while en route by private motorcoach. Also on our itinerary are three half-day sightseeing excursions. Baggage handling; transfers between hotels and airports; and an expert travel director are part of this deluxe tour. Canada is a real bargain, too. Their dollar exchanges for eighty-five cents American.

\$1398 per person, based on double occupancy, from Chicago.

The Majestic Canadian Rockies September 11-18, 1981



To the playground of gods! Our tour starts with four nights at Hotel Grande Bretagne on Athen's Constitution Square. Surrounded by the Acropolis, the Royal Gardens, Parliament Building and the Square of the Unknown Warrior, it's more than a century old, but up to date on convenience and service. Enjoy its opulence when not exploring the city's old quarter, the Acropolis or the Royal Palace.

Next we'll sail the Greek Isles aboard the *Stella Solaris* featuring exclusive resort accommodations. Optional shore excursions are available at ports of call. At Dikili, there's Pergamon where parchment was invented; we can savor the atmosphere in Istanbul, home to sultans and seat of the Byzantine Empire; at Kusadasi, gaze at the awesome remains of Ephesus and the Temple of Diana, one of the seven wonders of the world. At Rhodes, we'll enter the port where the mighty Colossus, another of the world's seven wonders, once guarded the harbor; on the island of Crete, wander through the Minoan palace, Knossos; at Santorini, we'll ride donkeys up cobbled streets to the capital of the volcanic island, thought by some to be the site of Atlantis; and our last stop, Mykonos, is an international resort with fine beaches.

We'll fly TransWorld Airlines scheduled wide-bodied jet, round-trip from Chicago to Athens. American breakfasts at the hotel and all meals and snacks on board ship are included. The tour package features transfers and baggage handling between airport, hotel and pier; experienced travel director; and optional excursions.

\$2465-\$3245 per person, double occupancy, based on cabin selection, from Chicago.

Athens Escapade and Greek Isles Cruise October 21-November 2, 1981



To the exotic and ancient cities of Jerusalem and Cairo and the river Nile! We begin with four nights at the Jerusalem Hilton Hotel with modern amenities to complement the exciting view from the city's highest point. The Old City offers us the realities of biblical places—Via Dolorosa, Holy Sepulchre, Western Wall, Dome of the Rock—and its energetic bazaars. In the New City we can visit the Knesset, Hebrew University and the Israel Museum.

Then we fly to Cairo for one night at the Heliopolis Sheraton Hotel before boarding the *H.S. Any* for a four-night cruise of the Upper Nile. On view from our air-conditioned, outside cabins are historic sights from Luxor to Aswan. And there are shore excursions to such as The Valley of the Kings and Queens, Tutankhamen's Tomb, the Aga Khan Mausoleum and the Aswan High Dam.

We'll return to Cairo for four nights at the Ramses Hilton Hotel to luxuriate in deluxe accommodations between forays to the Egyptian Museum, the Citadel, the Pyramids and the Sphinx.

Topping off our trip with one night at the Zurich International Hotel we can shop and rest before departing on a Swissair wide-bodied jet for Chicago. (Swissair jet to Tel Aviv and return from Cairo.)

Full American breakfasts while in Jerusalem, Cairo and Zurich and all meals for the four days aboard ship are included. Extras provided are transportation between airports, piers and hotels, as well as baggage handling; experienced travel director; and optional excursions in Jerusalem and Cairo.

\$2795 per person, based on double occupancy, from Chicago.

Land of the Pharaohs and Israel October 24-November 8, 1981



Travel Dept. WAA
650 N. Lake St., Madison 53706

Please rush brochures on:

- Majestic Canadian Rockies
 Athens Escapade & Greek Isles Cruise
 Land of the Pharaohs and Israel

Name _____

Address _____

City _____

State _____ Zip _____

Member News



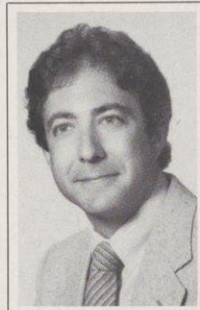
Noel '72



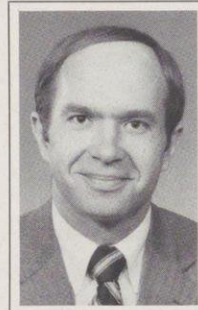
Price '43



Miller '54



Gardner '64



Grams '64



Harvey '64



Noel '72



Winningham '75

The Job Mart

BSEE, Ph.D.: Computer professional with academic, technical, managerial and some marketing experience seeks challenging position that will permit return to the Wisconsin area. I was initiated into computing on UW's first solid state machine. Have had some experience with IBM, but mostly with DGC, DEC and Harris. Member #8105.

Wisconsin Alumni Association members are invited to submit, for a one-time publication at no charge, their availability notices in fifty words or less. PROSPECTIVE EMPLOYERS are requested to respond to the member number assigned to each. Your correspondence will be forwarded unopened to the proper individual. Address all correspondence to: Job Mart, Wisconsin Alumni Magazine, 650 North Lake Street, Madison 53706.

10s Richard Benjamin Thiel '10,'24,'26 celebrated his 100th birthday in April at his home in Appleton. A story in the Post Crescent said he is "busy all the time. I even get my own meals." Among his many projects is letter-writing; he gets off some thirty or so a month to friends, to former students of his twenty-year teaching career at Lawrence College, to his son's widow, to his grandson and wife and their four children.

20s The latest issue of Purple & Gold, the national publication of the Chi Psi, reports that at its Christmas luncheon in Milwaukee it came as a surprise to no one but the recipient when the fraternity's Distinguished Service Award was presented to Gordon R. Walker '26, Racine. Says the story, "Brother Walker's kindness, generosity and personal dignity are legends at (the Madison chapter) and among the business community of Milwaukee and Racine. He is the type of Brother who makes you feel good merely by thinking about him." On hand for the ceremony were Gordon's son, Willard '55, and grandson Bill, now a student here.

30s Peg Stiles Lamont '35, '36 of Aberdeen, S.D., now serving her fourth term as a state senator, was honored by the AAUW in June, one of five women in the nation to be cited. Hers came because she is "a leader who has made a difference in community and state life."

And one of the other four to earn that same AAUW award at ceremonies in Washington, D.C. was Mildred Freburg Berry Ph.D. '37, Rockford. She was honored in the field of education, primarily as director of a training center she founded for children with speech handicaps. Dr. Berry taught at Rockford College for thirty-six years.

The first non-engineer president of Fond du Lac's Giddings & Lewis, Inc., George J. Becker '38, is getting ready to retire at the end of the year. He's been with G&L since graduation, in accounting until assuming the presidency in 1977.

40s Robert J. Cox '40, Menomonee Falls, was named the 1981 recipient of the Award of Merit by the American Society for Testing and Materials. Cox is a vice-president for research with Milwaukee's Ampco-Pittsburgh Corporation, and earned the ASTM honor for his "outstanding contributions to the creation of meaningful standards for materials engineering . . . and his unhesitating willingness to share his knowledge and talents."

Roger M. Christenson '41, '42, '44, director of research for PPG Industries in Pittsburgh, is the firm's first inventor to receive 100 patents on his work. He's been with PPG since 1944, and lives in Gibsonia.

James M. Price '43, '44, MD'51 is the new vice-president for international research and development at Norwich-Eaton Pharmaceuticals, Norwich, N.Y. He's been with the firm since 1978 after eleven years with Abbott Labs and a post as professor of oncology in our med school.

Charles H. Hawks '48, Pittsburgh, has been promoted to director of distribution for Westinghouse there. He joined the firm in 1966.

The International Woodworking Machinery and Furniture Supply Fair, to be held in September of '82 in Louisville and billed as "the fifth largest industrial trade show in the U.S.," will have as its chairman James S. Carroll '49. He is president of Black Brothers Company, Inc. in Mendota, Ill.

Marion Hawkins MS'49, Ph.D.'65 retired this spring from the English faculty of the UW-River Falls and will continue, she says, "to live in the present and dream of the future."

The American Institute of Mining, Metal-

lurgical, and Petroleum Engineers gave its Earl McConnell Award to *Franklyn K. Levin Ph.D.* '49. The award was established in 1968 to recognize engineers whose contributions "tend to advance the nation's standard of living or replenish its natural resources." Levin is senior research scientist with Exxon in Houston, where he lives with his wife, author *Beatrice (Schwartz) MS* '47. (See Badger Bookshelf, WA, May, 1981.)

50s *Owen D. Bakkum* '50 has added the title of chief executive officer to his duties as president of Northern Illinois Gas, Aurora. Bakkum, who has been with the firm since 1963, lives in Oak Brook.

Milwaukee radio station WISN has promoted its general sales manager, *Lee A. Dolnick* '54, to vice-president of sales.

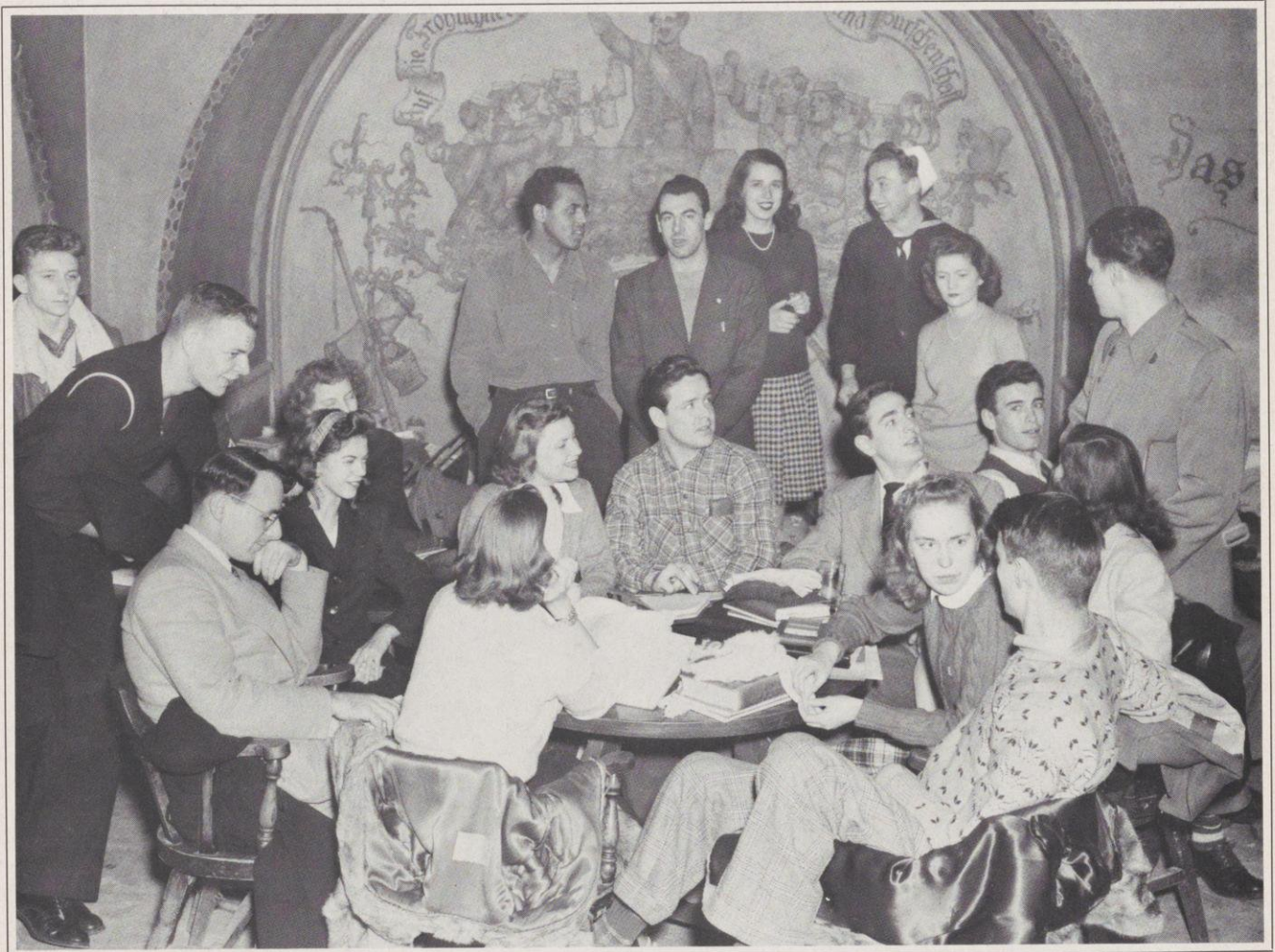
E. Robert Miller '54, senior vice-president of the Robert McNeil real estate firm in San Diego,

is the 1981 chairman of the property management committee of the International Real Estate Federation.

60s The California Trial Lawyers Association has elected as its president for 1981 *William M. Shernoff* '62, who lives in San Diego.

Jerry R. Lyman '63, with RKO General, Inc. since 1977, is the new president of its FM radio

The Way We Were—1



As the first in a new photo series we bring you this one taken in the Rathskeller in the early months of 1946. We're sure of identification of only two in the group: at extreme left is *Don Leidel* '49, '51, and seated toward the right, in coat and tie and looking up to your right, is *Pat Hernon* '50. A comparison with photos in the *Badger Yearbooks* for the '46-'50 years gives us a hunch that: the woman seated at left, in dark jacket and plaid headband, is *Polly Topping* '46; to the right of her is *Patsy Childs* '47; in the foreground, facing the camera, is *Doris Rinehard* '46; and she's talking to *Dick John* '51. But even if we've guessed these four correctly, our average is bad. How's yours? Put it in writing.

division. He and his wife and family live in Potosi, Md. Jerry is chairman of the Washington Area Broadcasters Association.

Lawrence A. Gardner '64, '66, Troy, Michigan, is the new president of the First Citizens Bank there. He joined its staff in 1971 after international banking experience in Ecuador for Citicorp.

David F. Grams '64, '68, '71 has left the Ma-

dison law office in which he was a partner to become a partner with the local CPA firm of Nehls and Tierney.

Jane Rosenbaum Harvey '64, '66, who lives with her husband and son in Rhineland, was elected to a three-year term on the school board there. She travels the northern half of the state as an admissions counselor for the UW-Platteville.

John Gable '66, '77, Denver, has been promoted by Amoco Production Company to a regional managership of employee relations.

Ijaz A. Qamar MS'66, Ph.D. '70 is on a two-year leave from the Canadian government to work for Pacific Consultants out of Washington, D.C. He's in Lusaka, Zambia, working on the establishment of an agricultural development bank, a project of the World Bank.

Francis F. Huppe Ph.D. '67, Wilmington, Del., has been promoted to the directorship of DuPont's engineering lab there.

Ag Alumni Football Fire-Up

Wis.—Mich. Game
Sept. 12
Stock Pavilion 10 a.—1 p.

Football ticket order form from 116 Ag Hall, Madison 53706. *Deadline: August 12.*

Fire-Up reservations accepted through *September 5* from WALSAA, same address. WALSAA members: \$3.50; others \$4.50

70s *Rosemary Aten Ph.D. '70*, on the physical faculty of Western Illinois University since earning her doctorate here, is their new department chairman. She lives in Macomb.

James K. Crossfield '70, '76, '77, a specialist on our engineering faculty, received the Wild Heerbrugg Geodetic Fellowship at last winter's meeting of the American Congress on Surveying and Mapping.

Nancy L. Noel '72, Manhasset, N.Y., commutes weekly to Boston where, at Boston University, she teaches a course as the first professor of nursing history in the nation. She has recently added the position of curator of nursing archives at a BU library.

The Burlington Northern Railroad has promoted *Alan R. Post '70, '72*, Cottage Grove, Minn., to assistant general solicitor in its law department.

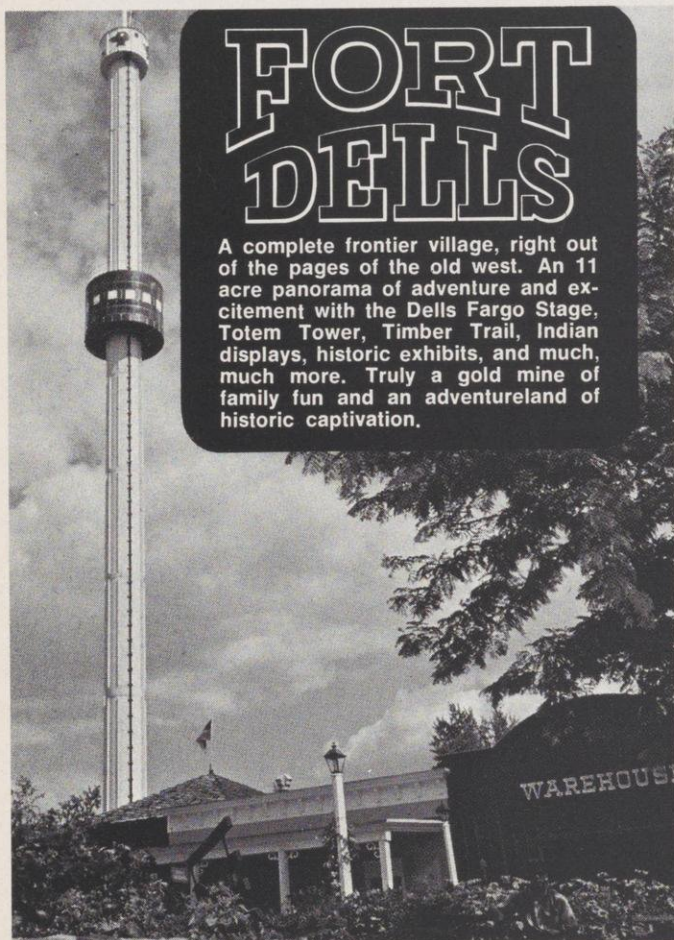
USDA researcher *Beth Walter Honadle '75* of Bethesda, Md., is the chairman-elect of the section on intergovernmental administration and management of the American Society for Public Administration.

Scott Winningham MA '75, Ph.D. '78 has left the Federal Reserve Bank in Kansas City for New York, where he's been appointed director of research and a market economist for the Fiscal Agency of the Farm Credit System.

A Navy Department release says Ensign *Marshall L. Narveson '78* won his wings in March after eighteen months of flight training. It says nothing about where he is stationed.

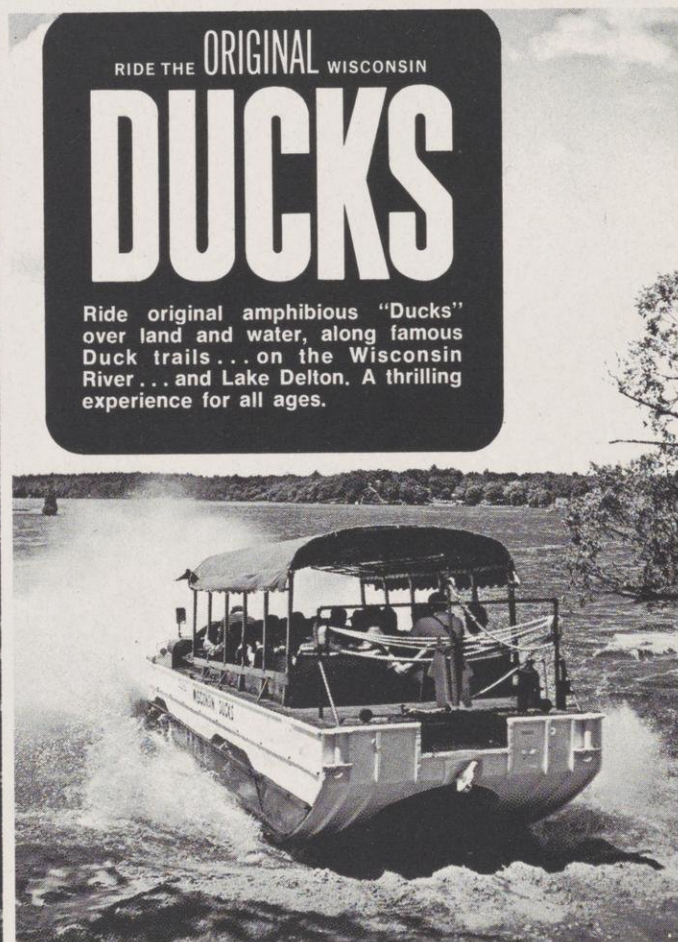
Ensign *John W. Graveen '79* reported in March for submarine duty aboard the USS Dace, homeported in Vallejo, California.

Steven M. Swasey '79 left a San Francisco insurance company to join Carl Byoir & Associates there. He lives in Oakland. □



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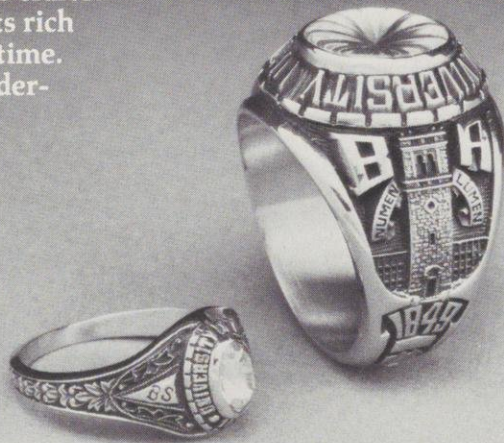
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3. A pen mark at point where edge of dot touches scale indicates size.

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Deaths

The Early Years.

Arthur W. Nicolaus '04, Beaver Dam. (*)
Edmund Cecil Harder '05, Montreal, Ontario (79)
Mrs. Benjamin M. Powers (*Edna M. Brown*) '08, Prairie Village, Kansas (79)
Mrs. Willard Smith (*Ethel E. Sabin*) '08, San Jose (3/81)
Mrs. Arthur J. Gafke (*Laura Frances Hill*) '10, Jefferson (3/81)
Taylor E. Ruby '10, Los Angeles (12/80)
George E. Cleary '11, '14, a New York tax lawyer and a founder of the firm of Cleary, Gottlieb, Steen & Hamilton. (3/81)
Mrs. Rudolph E. Smith (*Edith A. Sears*) '11, Fennimore (4/81)
Russell Argyle Evans '12, Oshkosh (4/81)
Willard Edward Farnham '12, '14, Carmel, Cal. (3/81)
Mrs. Henry R. Trumbower (*Josephine Allyn*) '12, Madison (5/81)
John H. Wolfe '12, Baltimore (4/81)
Mrs. Raymond C. Marsh (*Florence L. Gosselin*) '13, Greenville, S.C. (12/80)
Mrs. J. Riley Stone (*Vera Milhaupt*) '13, Reedsburg (2/81)
Samuel D. Wonders '13, Peterborough, N.H. (10/80)
Mrs. Harlow Bradley (*Ernestine Emma Chase*) '14, Milwaukee (1/81)
Frances Elizabeth Leenhouts '14, Milwaukee (12/80)
George E. Youngberg '14, Venice, Fla. (12/80)
Mrs. Carl B. Huffman (*Adele Masten*) '15, Baldwin City, Kansas (3/80)
Mrs. McKerial Rodolph (*Frances Hemphill*) '15, Houston (3/81)
Louis Bloch '16, labor relations expert who recommended California's first system of unemployment insurance and who served on the War Manpower Commission in World War II. San Francisco (3/81)
Charles William Clifford '16, Woodland Hills, Cal. (4/81)
Mrs. Lorren Garlichs (*Sarah Elizabeth Warwick*) '16, St. Joseph, Mo. (11/79)
David Benjamin Morris '16, St. Paul (3/81)
Mrs. Philip H. Porter (*Ruth Marie Thomas*) '16, Madison (3/81)
Oscar John Sieker '16, Sheboygan (4/81)
Leroy Jerome Engelke '17, Long Beach, Cal. (*)
Elizabeth Brett White '17, Wilmington, Del. (1/81)

Mrs. James G. Dickinson (*Margaret Chamberlain*) '18, Milwaukee (3/81)
Robert Whilmer Leukel '18, Arlington, Va. (*)
Mrs. John Nansen (*Dorothy A. Helmes*) '18, St. Louis (*)
Herbert Glaetli '19, Independence, Kansas (12/80)
Mrs. Baltus Rolfs (*Elsie Dorothy Graber*) '19, West Bend (*)

20s Philip Gorder Fox '21, Madison (3/81)

Mrs. Walter Jenks (*Anna Helen Hadfield*) '21, Baraboo (3/81)
I. Dalven Julian '21, Mineral Point (3/81)
Joseph Ashton Roman '21, Lake Bluff, Ill. (11/80)
Howard Bailey Stark '21, Nashotah (3/81)
Joseph Byron Deming '22, Seminole, Fla. (2/81)
Harlan George Groffman '22, Oconomowoc (2/81)
William Merritt Sale '22, Ithaca, N.Y. (1/81)
Lewis Walter Taylor '22, Berkeley (3/81)
Max E. Walther '22, Medford (3/81)
Edward Joseph Frawley '23, Milwaukee (12/80)
Horace Phillips Wheeler '23, Omena, Mich. (4/79)
Bowman Knight Breed '24, Northbrook, Ill. (3/81)
Mrs. John B. Bernard (*Mabel Elizabeth Kimmel*) '24, Sacramento ('80)
Mrs. George W. Horton (*Leah May Burnsted*) '24, Jacksonville, Ill. (2/80)
Harvey Henry Karnopp '24, Milwaukee (4/80)
Edward Herman Kietzman '24, Clinton (3/81)
Martha C. Mehnert '24, Wauzeka (*)
Rexford William Michaelis '24, Clintonville (3/81)
Courtland Reed Conlee '25, retired vice-president of the Milwaukee Journal Company and on its staff for 45 years before retirement. Whitefish Bay (4/81)
Mrs. Albert E. Hunter (*Lorraine Ellyn Dickinson*) '25, West Chatham, Mass. (3/81)
Mildred Elise Hutaff '25, Wilmington, N.C. (1/81)
Mrs. Harold W. Landwehr (*Gladys M. Boerner*) '25, Milwaukee (11/80)
Amos Benjamin Carlile '26, Jetmore, Kansas (7/80)
Frances Vivian Cobabe Albert '26, Alexandria, Va. (1/81)
Mrs. N.E. Hootman (*Agnes Maurine Larson*) '26, Davenport, Iowa (1/81)
Mrs. Henry C. Weinlick (*Elsie Emma Heise*) '26, Madison (4/81)
James Gardner Meyst '27, Elm Grove (2/81)
Merrill A. Scheil '27, Milwaukee (4/81)
Bernard Henry Vollrath '27, Detroit/Tarpon Springs, Fla. (4/81)

Harold Floyd Hansen '28, Mountain View, Cal. (9/80)
James Herbert Heise '28, Mahtomedi, Minn. (3/81)
David Edgar Lindstrom '28, Urbana (3/81)
Robert Erwin Pabst '28, Westport, Conn. (5/80)
Frank J. Schlies x'28, Kewaunee, Wis. (10/80)
George Hermon Tagatz '28, Sioux City (2/81)
John Gordon Thompson '28, for 25 years Madison's city engineer (4/81)
Mrs. Willard N. Thompson (*Merna Mildred Miller*) '28, Portland, Ore. (3/80)
Margaret Elizabeth Brammer '29, Redwood Falls, Minn. (7/80)
Alice A.W. Kelly '29, Milwaukee (10/80)
George Austin Lewis '29, Kansasville, Wis. (3/81)
Mrs. Bertram W. Nason (*Irene Dorothy Johnson*) '29, Wisconsin Rapids (2/81)
Wesley F. Peterson '29, longtime reporter, freelance writer and editor, primarily in the area of crime news and publications. Forest Hills, N.Y. (4/81)
Herbert S. Phelps '29, Sun City, Fla. (3/81)
Harry Edwin Sagen '29, Downers Grove, Ill. (*)
Willard Frank Stark '29, Reseda, Cal. (2/80)

30s Eugene Goodman x'30, Highland Park, Ill. (3/81)

Duane Earl LaMaster '30, Sun City Center, Fla. (3/81)
Oscar Helmer Olson '30, Rockford (10/77)
Allen Joseph Shafer Sr. '30, whose son and namesake died of football injuries here in 1944. Madison (5/81)
Allen J. Tenny '30, Middlebury, Vt. (3/81)
Mrs. George Zimmerman (*Camille Ann Ruskauff*) '30, '39, Wauwatosa (4/80)
Clarence William Buending '31, Hastings, Minn. (2/81)

(*) Informant did not give date of death.

Earl Irwin Cooper '31, Madison (3/81)
Harold Lee Gross '31, Oak Park, Ill. (11/79)
Frederick John Sargent '31, Madison (3/81)
Sara Sisserman '31, Milwaukee (11/80)
Hjalmar A. Skuldt '31, West Bend (*)
Eleanor E. Fraizer '32, Mequon (8/79)
Paul Pyzer Goodman '32, MD '34, Milwaukee (1/81)
Walter Fredrick Lappley '32, 'MD'34, Cross Plains (3/81)
George Lewis Ott '32, Cedarburg (6/80)
Merry Maude Wallace '32, Ypsilanti (*)
Frank C. Hildebrand '33, Minnetonka, Minn. (4/81)
Mrs. Arthur J. Westenberg (*Elizabeth Jean Gould*) '33, Chula Vista, Cal. (7/79)
Hildegard Martha Pilger Kipp '34, Madison (3/81)

Jewel Carrie-Mae Hardkopf '35, Midland, Mich. (6/80)

Lee Philip Longley '35, MD'37, Sheffield, Ohio (3/77)

Mrs. Stanley Redfern (*Mary Virginia Moody*) '36, Lansing, Mich. (2/81)

Mack Hendricks Singleton '36, Madison (8/80)

Robert Louis Spanagel '37, Appleton (3/81)

Mrs. F.W. Baker (*Isabel McDowell*) '38, Blanchardville (4/81)

Lawrence Jacob Hasslinger '38, Kenosha (12/80)

Harley Smyth Whitmore '38, Santa Rosa, Cal. (3/79)

Elizabeth Louise Hill Johnson '39, Mercer Island, Wash. (3/81)

Anton John Jurik '39, Kenosha (4/81)

Edward Joseph Thornton '39, Madison (3/81)

40s *Lawrence Edward Zachow* '40, Niceville, Fla. (*)

Mrs. Seymour Edwards (*Dorothy Dorlos Horsfall*) '41, Prairie du Chien (8/80)

Mrs. Eugene Lepeschkin (*Julie Ann Wilson*) '41, whose book, DANCE AND RELIGION, was mentioned in Badger Bookshelf in our May issue. Burlington, Vt. (9/80)

Eileen Marie Norton Gallagher Morgan '41, Wausau (3/81)

Donald V. Stophlet '41, '46, Melbourne Beach, Fla. (9/80)

William Henry McGibbon '42, Oregon, Wis. (3/81)

Irvin Leon Slotnik '42, MD'44, Milwaukee (3/81)

Edward Robert Vogel '42, Milwaukee (12/80)

Sidney Riegelman '43, San Francisco (5/81)

Betty Jane Egan Jacques '44, '45, Madison, who taught in the Center System and at Wisconsin High School in the late '40s and early '50s, then was an instructor for USAFI, and since 1968 was an editor of Independent Study for the Extension. (5/81)

Thora Mabel Hickerson Crowder '45, Oxford, Miss. (3/77)

Jessie Ellen Gardner '46, Horicon (4/81)

Daniel Lincoln Conley '47, Madison (3/81)

Harlan Glen Kittleson '47, Northbrook, Ill. (6/79)

Rev. *Norman Palmer Scheide* '47, Hudson/Menomonie (3/81)

LeRoy Ainley Schultz '47, Monroe (4/81)

Hans August Jackel '48, Madison (4/81)

Mrs. Bernard J. Young (*Helen Anderson*) '48, Madison (3/81)

Raymond Bernard Esser '49, Madison (3/81)

Robert D. Morris '49, Mission, Kansas (3/81)

50s *William Edward Bonadurer Jr.* '50, La Crosse (3/81)

Mrs. Ernest Slovak (*Margaret Elizabeth Graham*) '50, Beaver Dam (3/81)

Franz Walter Brand '51, Monroe (2/81)

Ruth Elizabeth Socolofsky '52, Billings, Mont. (11/79)

Thomas Leigh Aschbrenner '54, Northridge, Cal. (2/81)

Harry James Dell MA '57, Ph.D. '64, Charlottesville, Va. (5/81)

Eugene Leroy Yurich MD '55, Santa Cruz, Cal. (*)

Paul James McInerney '57, Millersville, Pa. (2/80)

Imants A. Murmanis '59, Madison (4/81)

70s *Richard Michael Leach* '71, Sheboygan Falls (4/81)

Helen Marie (Mrs. Robb) Johnson Ph.D. '72, Madison/Oshkosh (4/81)

Mrs. Robert M. Cohn (*Shirley Edythe Fishman Grodsky*) MA '76, Madison (4/81)

John G. Hoffman Ph.D. '77, LaFayette, Cal./Clemson, S.C. (2/81)

Terence Thomas Butler '78, Madison/Key Biscayne (3/81)

Faculty

Emer. Prof. *Samuel T. Burns*, 86, on our music faculty from 1949 to retirement in 1965, and its chairman from 1952, in Madison, 4/81. Burns was a nationally recognized music educator and had authored two books on music on the elementary-school level.

Emer. botany Prof. *Herbert M. Clark MS* '33, Ph.D. '35, in Madison (4/81). After service in World War II he returned to the botany faculty, remaining until retirement in 1974.

John A. Cappon, Manhattanville, Kan., '84, in English during the early '40s, then in mechanical engineering in the late '50s and mid-'60s. (5/81)

We apologize for the delay in bringing you the announcement of the death of Emer. Prof. *Roe-Merrill Heffner* last February in Madison. He was a member of the faculty of the German department from 1938—its chairman beginning in 1946—until retirement in 1963. Among his writings, GENERAL PHONETICS (1946) remains a standard reference.

Jacob R. Jacobson, 85, Eau Claire (3/81) a member of the Class of 1922, and an instructor and supervisor of the Arboretum from 1949 to 1962.

Prof. *Edgar W. Lacy*, 67, Madison (3/81), on the faculty of the English department, where he was still active, since 1941.

Emer. Prof. *Villiers W. Meloche*, 85, Tucson, in the chemistry department from 1921 to retirement in 1966. He served on the Athletic Board, and was board chairman of the UW YMCA. Memorials to the UW Foundation, 702 Langdon St., Madison 53706, in Meloche's name, for scholarships in chemistry. (3/81)

The announcement of the December death of *Richard U. Ratcliff* '27, Santa Cruz, Calif., in our May/June issue, inadvertently left off his faculty affiliation. An international authority on urban land economics, he was on our commerce faculty from 1944 to 1968. His text, URBAN LAND ECONOMICS, is considered a classic reference.

October 6 is Day With The Arts

The morning program offers you a choice of two of the following seminars:

Prof. Tino Balio
(Dir., Center for Film
and Theater Research):
**Art and Business
in Hollywood's
Golden Age.**

Prof. Sandy Kita
(Art History):
**Townsmen vs.
Classical Tradition
in Ukiyo-e Prints from our
Van Vleck Collection.**

Warren Carrier
(Chanc., UW-Platteville)
**Understanding
Contemporary Poetry**

Music Profs. David Hottman,
Thomas Farraio, Sam Jones
and Dale Gilbert
in a **Vocal Quartet.**

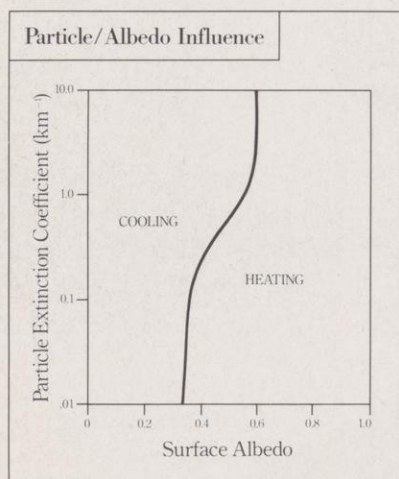
Following luncheon,
the afternoon program
features:
Prof. Richard Davis (Music)
and students in
A Jazz Combo.

Registration,
morning coffee-and-rolls,
and luncheon: \$12

Registration blanks will be mailed
to all previous registrants
and will be printed
in the September/October issue.

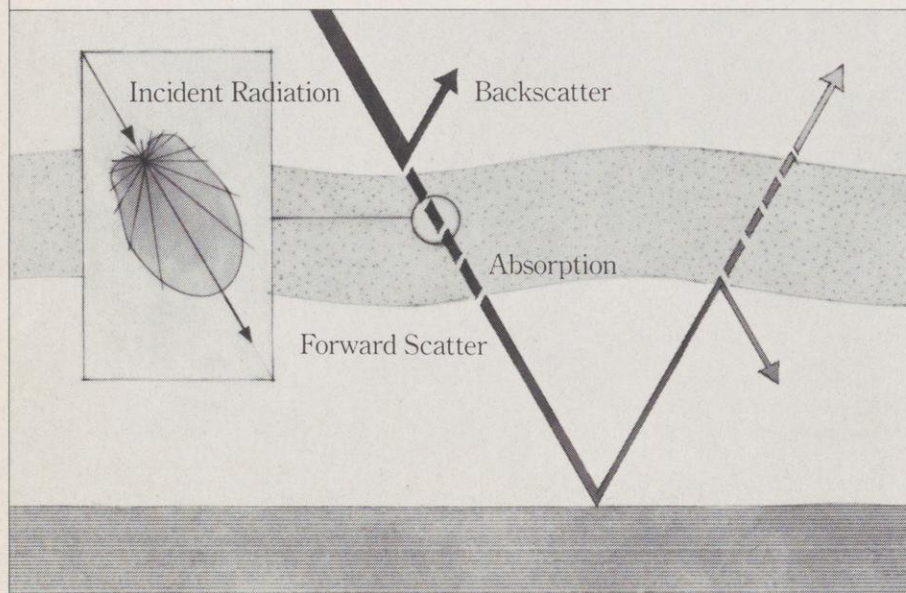
The Albedo Effect

Mathematical models of the atmosphere are the chief scientific tools for predicting long-term climate and identifying possible climatic changes that may result from man's activities. Recent advances at the General Motors Research Laboratories have revealed new information about the contribution of airborne particles to the delicate thermal balance of the earth's atmosphere.



Regions of heating and cooling determined by particle characteristics and surface albedo.

Radiation scattering exhibited by a layer of particles. The inset shows the distribution of scattering by a single particle of mean size.



DEVOID of its atmosphere, the bare earth would reach an average temperature of only -1°C . Atmospheric interaction with solar and terrestrial radiation raises the average surface temperature to fifteen degrees Celsius, making life as we know it possible. Small fluctuations in overall temperature can have large-scale effects. It is believed that a drop of a few degrees Celsius lasting for a period as short as four years could trigger an ice age. Fundamental studies conducted at the General Motors Research Laboratories explore the effect of various atmospheric factors, natural and man-made, on the earth's thermal balance.

New knowledge of the influence of airborne particles on the earth's thermal balance has

been revealed by investigations carried out by Dr. Ruth Reck. Dr. Reck's work at General Motors integrated for the first time the complex factor of particles into radiative-convective atmospheric models. Her findings help determine under what conditions particles have a cooling influence, and under what conditions they have a heating influence.

Airborne particles have many sources: volcanic issue, wind-raised dust and sea salt, ash, soot, direct and indirect products of combustion and industrial processing, the products of the decay of plant and animal life, the liquid droplets and ice crystals that make up clouds. Particles alter the radiation flow in the atmosphere by the processes of scattering and absorption. Particles differ by size and composition, factors which determine optical properties.

Prior to Dr. Reck's work, models for calculating the vertical temperature profile included layers of clouds and the significant gases— O_2 , O_3 , H_2O and CO_2 —but neglected the particle factor. To establish the thermal effect of particles, later models assumed a uniform vertical temperature change.

Dr. Reck's contribution was to add the particle factor to a one-dimensional model developed at the Geophysical Fluid Dynamics Laboratory at Princeton University. This model divides the atmosphere into nine layers. An initial temperature distribution is assumed, and the model is used to compute the net radiative energy

flow into or out of each layer. A particle population is input for each layer. Calculated radiation imbalances result in a temperature change for each layer within the model, subject to the condition that change in temperature with altitude not exceed the adiabatic lapse rate. The new temperatures are used to compute a new radiation balance. This process is repeated until there are no further changes in temperature.

The particles of interest, known as Mie-scattering aerosols, are comparable in size to the wavelength of the incident radiation. Dr. Reck models the interaction of these particles with the radiation field in terms of two parameters: the single scattering albedo of the particle, which describes backscatter, and an anisotropic scattering factor, which measures the degree of forward scatter. From these two quantities and the size distribution and abundance of the particles, the transmission, absorption and backscatter of each layer in the model can be calculated.

DR. RECK discovered that whether particles have a heating or cooling influence depends upon the surface albedo, or reflective power, of the earth directly beneath them. Snow (0.6) is more reflective than sand (0.3); water is less reflective than either (0.07). Her results indicate that when surface albedo is small, the net effect of particles is to "shield" the earth from incoming solar radi-

ation, producing a cooling influence. When surface albedo is large, a trapping effect prevails, in which the portion of solar radiation that reaches the earth's surface is "trapped" between the surface and the particles, producing a net heating influence. The competition between these two effects, shielding and trapping, determines the overall thermal influence of particles.

Dr. Reck calculated that for the latitudes between the equator and 35°N, where average surface albedo is low, the current background level of atmospheric particles decreases solar radiation reaching the earth by ~1%, thus producing a net cooling effect. Her findings indicate that heating takes place at latitudes north of 55°N, where average surface albedo is high. Calculations with the model indicate a correlation between the increase in particle abundance due to volcanic activity in 1970 and a subsequent ice build-up in 1971.

"Previous models did not adequately take into account the role played by particles in the earth's thermal balance," says Dr. Reck. "The geosystem is continually changing. It is important for us to understand the elements that affect this evolution, so that we may know how man's activities influence the atmosphere."

THE WOMAN BEHIND THE WORK

Dr. Ruth Reck is a Staff Research Scientist in the Physics Department at the General Motors Research Laboratories.



Dr. Reck received her Ph.D. in physical chemistry from the University of Minnesota. Her thesis, on the statistical mechanics of heterogeneous systems, concerned the theory of diffusion-controlled chemical reactions. Prior to joining General Motors in 1965, she was a Research Associate in the Applied Mathematics Department of Brown University.

In addition to global climate studies, Dr. Reck has done research at General Motors in solid state physics and magnetic materials. Over the last seven years, she has participated in several international exchange programs on climate-related subjects.



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ITEM	SIZE	ITEM	SIZE	ITEM	SIZE
<input type="checkbox"/>	ADULT	<input type="checkbox"/>	ADULT	<input type="checkbox"/>	ADULT
<input type="checkbox"/>	CHILD	<input type="checkbox"/>	CHILD	<input type="checkbox"/>	CHILD

Please send to:

Name _____
Street _____ City _____
State _____ Zip _____

Please Charge to:

Name _____
Street _____ City _____
State _____ Zip _____

Chk. _____ M.O. _____ Amount _____

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