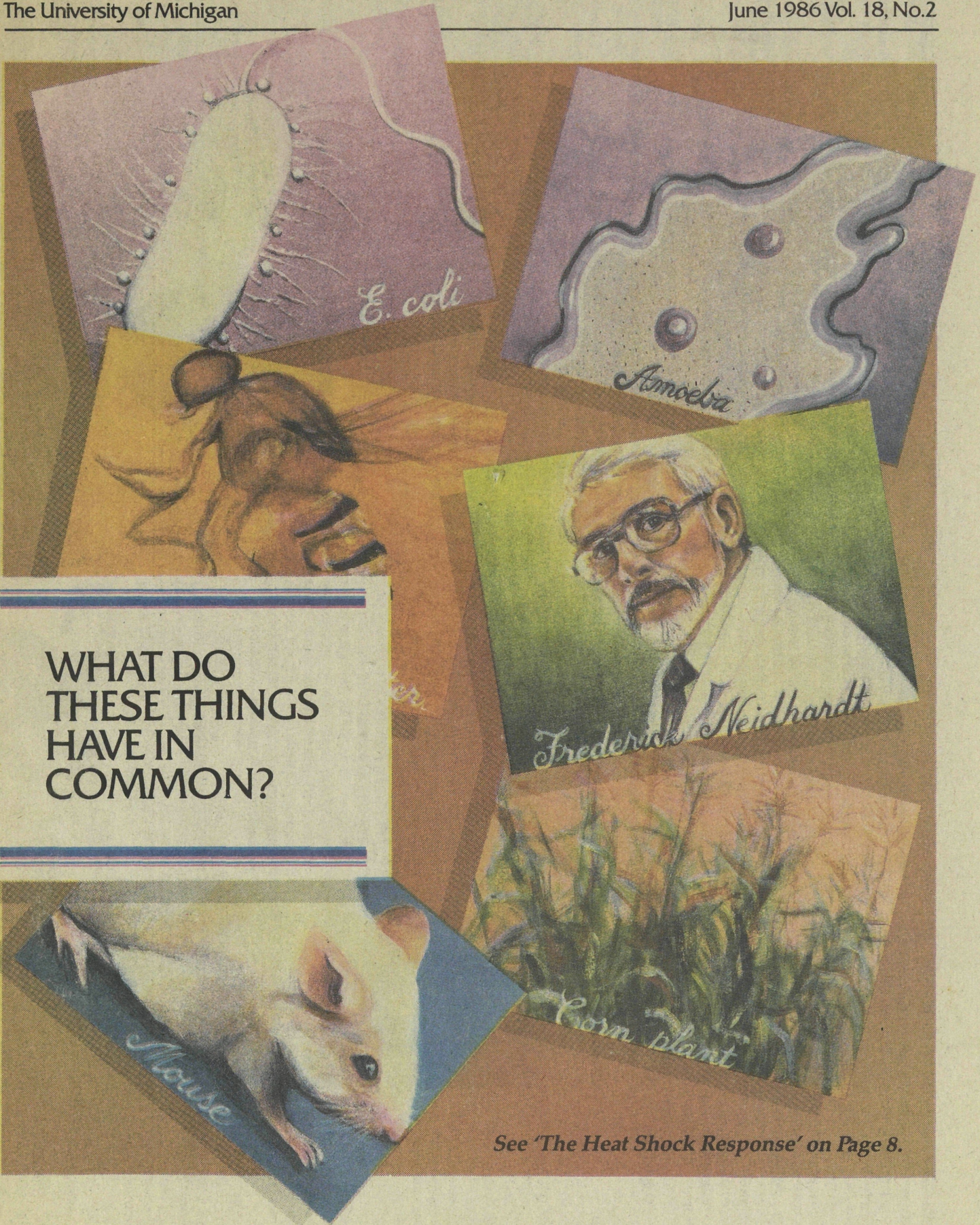


Michigan Today

The University of Michigan

June 1986 Vol. 18, No.2



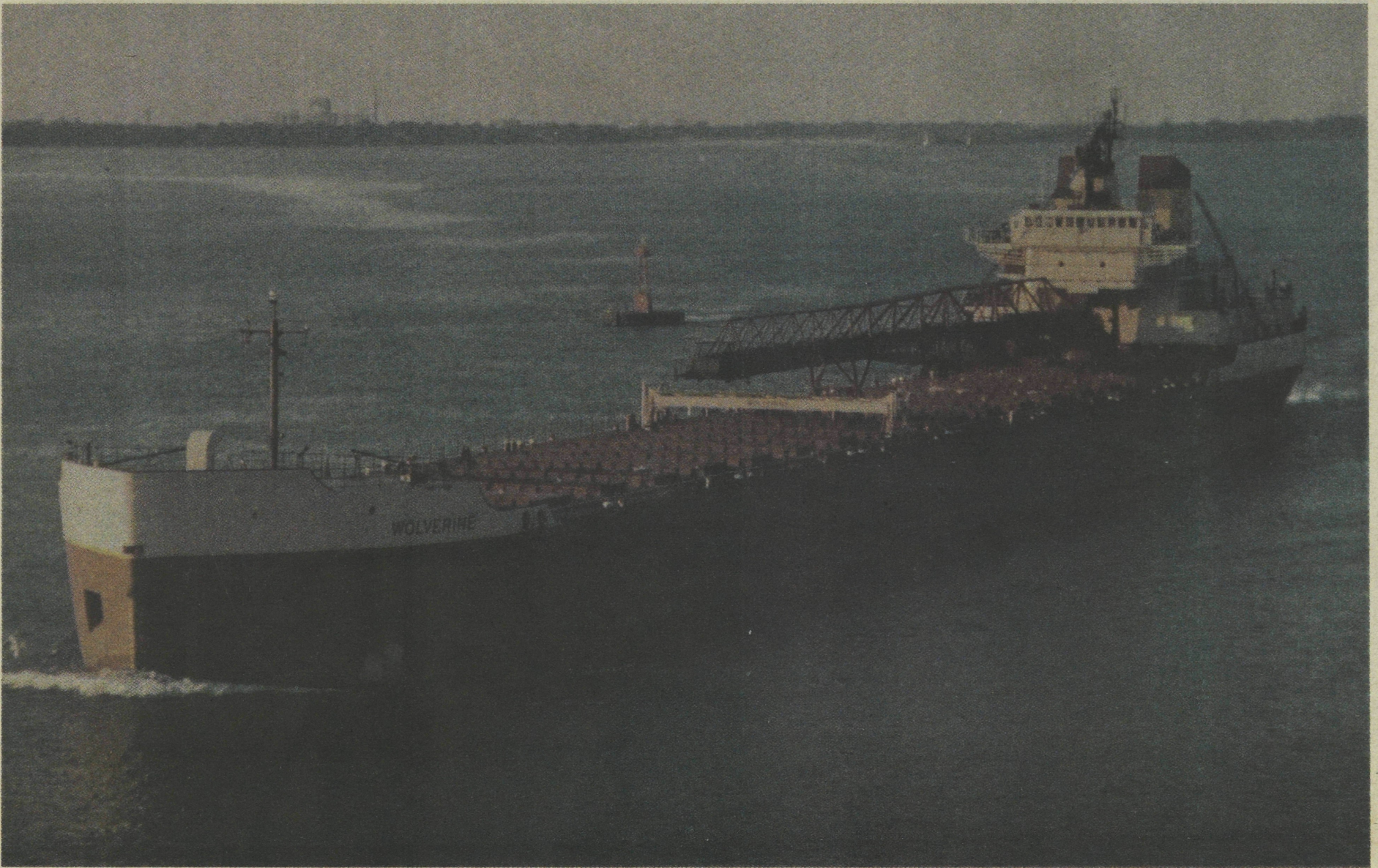
WHAT DO
THESE THINGS
HAVE IN
COMMON?

See 'The Heat Shock Response' on Page 8.

Michigan Today

The University of Michigan

June 1986 Vol. 18, No.2



THE WOLVERINE, a 630-foot Great Lakes ore carrier, is one of 17 Oglebay Norton Co. vessels under the direction of U-M naval engineering alumnus John K. Stuart ('54), the Cleveland firm's fleet engineer. Designs for ships like the Wolverine, which can cost \$30 million, benefit from research and testing done under contract at the U-M's Department of Naval Architecture and Marine Engineering. A design that underpowers a ship will lower the number of trips it can make a year; providing too large an engine will add tens of thousands of dollars in unnecessary fuel costs. (Photo courtesy Oglebay Norton Co.)

By Kit Boss

In 1900, The University of Michigan lured a young assistant professor from Scotland to Ann Arbor to captain a new unit within the College of Engineering—the Department of Naval Architecture and Marine Engineering.

Herbert Sadler arrived just days before classes were to begin.

He was brought here by Mortimer Cooley, later the first dean of the College of Engineering, whom the Navy had detailed to U-M 18 years earlier to serve as professor of steam engineering and iron shipbuilding.

Cooley — a self-proclaimed "scientific blacksmith" who held no academic degree till after his retirement — had foreseen the need for talented marine designers and engineers in the Middle West. Great Lakes shipbuilders were beginning to turn out more and more vessels, and Cooley saw the U-M as the school ideally situated to turn out the engineers to design those ships.

Cooley Searched the Land

Cooley searched the land for a suitable candidate to head the new department. Finding none in the States, he turned his attention to Europe and recruited Sadler from the University of Glasgow.

Upon his arrival in September 1900, Sadler moved quickly. Within days he fashioned a curriculum that offered courses in ship calculations, strength of ships, stability of ships, resistance and propulsion of ships, design of ships, practical shipbuilding, marine engineering and drawing. He taught all but one of the courses himself. During that first year, Sadler and his students grappled with engineering problems posed by new technology: steam power, screw propellers and steel hulls.

The department has changed greatly since Sadler taught his first class. Today, its students

THE VICTORS AT SEA

Despite what your
maps may say, the U-M
isn't landlocked

and professors are more likely to study the problems of hydrofoils, floating power plants and oil rigs that stand in water deeper than the Sears Tower is tall.

The staff has grown from two professors to 14, course offerings from eight to more than 40, and students from a handful to 150 to 200 in recent years, divided relatively evenly between undergraduates and graduate students, and between U.S. and foreign students. The first woman graduated from U-M's program in 1949, although no

more than three have tended to be enrolled in any graduating class. "Most of our graduates face the problem of which job offer to accept, not whether they will get one," says Prof. Michael Parsons, the department's chairman, of a field that has 10,000 practitioners nationally, though many aren't formally trained.

Recently, the department upgraded its 83-year-old towing tank — where model ships are subjected to controlled and calculable hydrodynamic forces (see related story) — and moved from its shared quarters in West Engineering to a building of its own on North Campus.

The typical student entering the program changed as well.

There is a notion of men and women being drawn to the sea and to the boats that ply the sea, obsessed with designing and building strong ships that move in harmony with the waves.

But a passion for the sea is no longer the propellant it once was for students in the program. Two decades ago, says Professor Parsons, about 70 percent of the students in the program were there for the love of sailing, "especially during the Vietnam War era, when we were seen as 'clean' and our enrollment rose to 400 while aeronautical engineering lost favor."

In the early '70s the department graduated several successful sailboat designers (Brendan Dobroth won the 1984 Canada's Cup, and two of the other four finalists were fellow U-M alumni from those days, Bruce Nelson and Eric Schlageter). Though the department's curriculum, then as now, was geared more to designing offshore oil rigs and tankers, half the undergraduates' senior projects in any given term were racing sailboat designs.

But the economic winds changed directions, and today few students choose projects that may wind up only as an avocation. Parsons says just one student worked on a one-man racing hydrofoil as his senior project last term.

(Continued on page 2.)



HERBERT SADLER came to U-M in 1900 from the University of Glasgow and soon headed the new Department of Naval Architecture and Marine Engineering. Mortimer Cooley wrote of Sadler to the man who would do the recruiting: 'I feel sure that \$2,000 per annum will bring him, as he is now not getting more than \$1,000 at the outside. If, however, you find that he really (he may hold out a little) will not come for less than \$2,000, I think that you would be justified in giving him \$2,200.' Sadler, who was also an outstanding aeronautical engineer, came for \$2,000 and later succeeded Cooley as dean of the engineering college.

(Continued from page 1.)

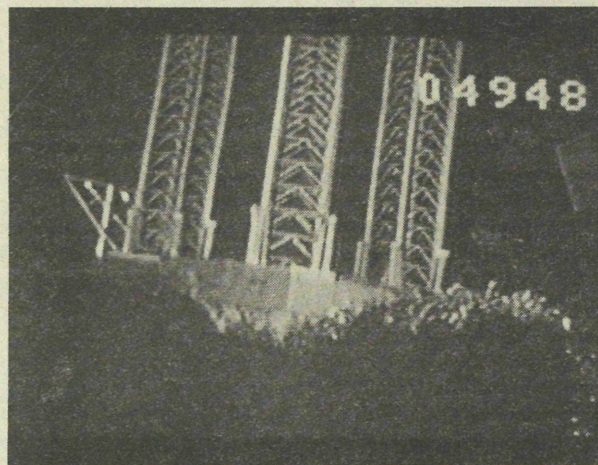
"Today's student seems to be practical, business-minded," Parsons says. Indeed, many of the problems students learn to solve mix engineering and economic factors, like designing a ship that can most cheaply transport a given cargo.

This task forces them to determine and design the optimal hull shape, propeller configuration design and engine size, depending on how large the cargo is and how far and fast it must be carried in a given river, lake or ocean run. The right combination — which Parsons says usually involves resisting the temptation to over-power the vessel — can save a shipper from \$80,000 to almost \$1 million a year in fuel, labor and other costs.

The Ideal Configuration

Determining the ideal vessel configuration is an elegant classroom and real-world exercise, as is improving the planning of the shipbuilding process and the way ships are built, two factors of shipbuilding productivity that the department is paying increasing attention to.

Nonetheless, fewer marine engineers are working on shipbuilding problems today than 20 years



A MODEL JACK-UP oil-drilling rig, whose three latticed legs are jacked down to the ocean bottom, is tank-tested for motion in waves with its legs at various elevations; results are monitored via TV. 'These rigs are good down to 400 feet,' Parsons says. 'For deeper waters, we have semisubmersible rigs whose underwater sections are flooded with water that stabilizes them while letting them respond to wave motion.'

ago because the American shipbuilding industry has drifted into the doldrums — especially shipbuilding around the Great Lakes, one of the driving forces behind the formation of U-M's program.

With commercial shipbuilding foundering, the U.S. Navy is providing the demand for most ships built in this country today. Parsons estimates that 70 percent of the American students in the program will wind up working for the military. "Whether a student's interest is sailing or

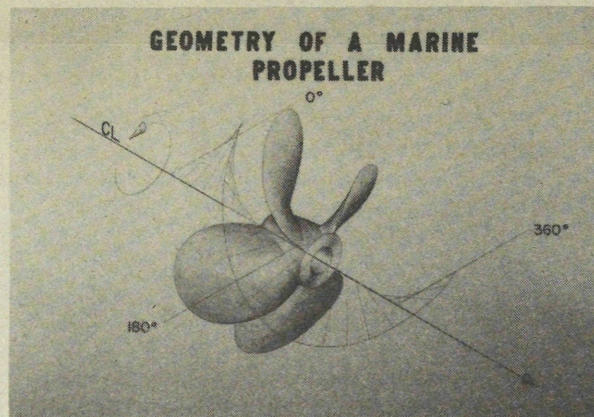


MORTIMER COOLEY was the only mechanical engineer in the state when the Navy detailed him to the U-M to teach steam engineering and iron shipbuilding in 1879. He brought not only the beginnings of naval architecture and marine engineering to the University, but engineering education as a whole, heading engineering in 1904 and becoming the first dean of the College of Engineering when it was established in 1915.

Navy work," he adds, "what we teach is the same. Although we don't do classified research here, we do some proprietary research — we can describe the projects but not the results."

The Tug of Industry

Responding to changes in the industries that employ their graduates, the department has been "dragged into the ocean, so to speak," Parsons says, in the wake of the offshore oil industry. "Despite the current downturn in the industry," he continues, "we know there will be an ever greater need for oil and gas from the oceans in the future.



Propellers

'THE ORIGINAL propeller was developed from the screw credited to Archimedes in the Third Century B.C.,' says Stuart Cohen, a researcher and lecturer in the naval architecture and marine engineering department. The long, broad-threaded screw was encased in a tube and used to raise water, for example to pump water from one irrigation canal to a higher one.

'Someone said, OK, if we can move water with a stationary screw why not use a screw to move a boat and keep the water still?' Cohen continues. 'In 1837, Francis Pettit Smith tested a wooden screw as a way to propel a boat. The screw, which had maybe three rotations to it, broke during the trial. But the boat then went faster. Smith twice pared more sections off, and the boat went faster both times.'

Smith's parings had left him with a propeller. The next year, he built and launched the Archimedes, a three-masted schooner with engine and, Eureka!, it worked.

Topographically, Cohen explains, a propeller is a section of a helix, or spiral, with as little area as possible — so that friction is minimized — but with enough surface area to deliver the force from the engine driveshaft to the water.

Most commonly, propellers have three or four blades. Submarines generally have seven-bladed propellers. Theoretically, a propeller could have any number of blades, but in practice the blades begin to interfere with each other when more than seven are used. Two blades are impractical because they are affected too strongly by the wake.

Small boat propellers are generally steel, though some manufacturers have developed plastic props for small boats. The propellers that power large ships are usually made of silicon brass.

THE VICTORS AT SEA

Exploration and exploitation will take us into deeper and deeper waters. The industry started at the shore on dry land with civil engineers. Then it went to marshlands, then out to sea. Now it's pushing farther and farther out, and the flow of the industry out to deeper waters has been supported, literally, by innovations in engineering technology.

As a result, offshore engineering courses, which will soon make up half the department's offerings, must train engineers who can figure out how to tow a gargantuan drilling platform out to sea and moor it to the ocean floor thousands of feet below. By the year 2000, Parsons predicts, marine engineers will have figured out how to fasten rigs in 4,000 to 5,000 feet of water — more than double the current depths.

An alumnus of the department's graduate program who expects to be deeply involved in such projects once the recession in his industry has passed is Dave Lorenz (M.S.E. '73) of the Marathon Le Tourneau Company in Houston.

A Hostile Environment

"Deeper water means more hostile environments," Lorenz says. "To moor a platform in 1,000 or more feet of water is a billion-dollar investment. To cut costs, everyone is looking at ways to float production facilities in deep water. There are none now, but we're working on that. Semisubmersibles [see caption for the oil rig photo] are also being looked at, and combination drill rigs and floating production systems."

Right now, mooring such facilities, whether by attaching them to piles driven into the ocean floor or with high-tech buoys, remains the toughest problem. "All deep waters present their own hazards," Lorenz explains. "Down here in the Gulf of Mexico, you have to design for hurricanes. You'll be out there 20 to 30 years producing over your wells, so you're pretty sure to experience at least one big hurricane, and when one hits, you can't disconnect from your mooring and move into port."

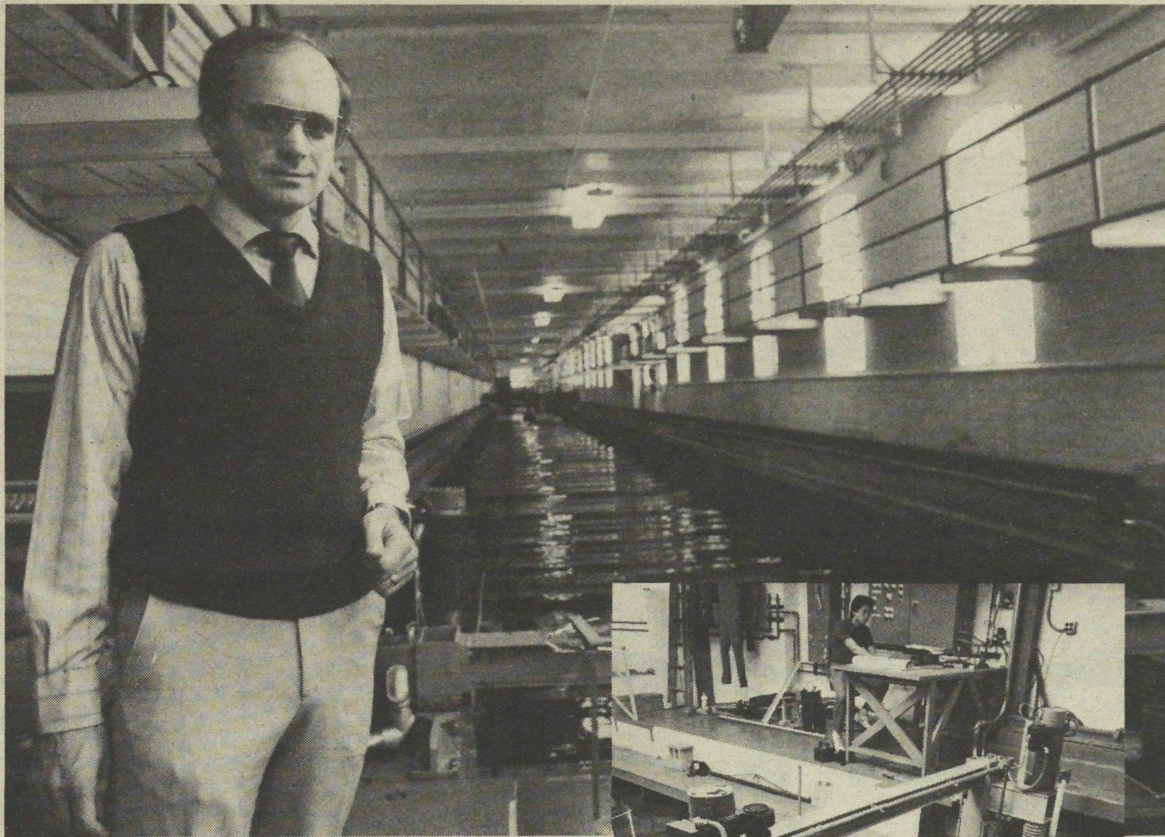
These and other offshore tasks that "present problems on a par with the magnitude of the space shuttle" excite U-M scholars like Parsons, who foresees similar challenges in such other futuristic constructions as power plants and airports in the sea.

New computer technology has better equipped scholars, students and professional engineers alike to plunge ahead, but in the academic setting, computers are used more for theoretical and analytical work than for experimental.

But even to students, there are practical benefits from computerization. Parsons says the department is upgrading its computer-aided design capabilities so students can enter a set of equations that specifies, for example, the shape of a ship's hull and then use a computer to produce a picture or model of that hull. This technique saves a lot of time that used to be spent on the drawing board or in the model room.

"We're an engineering department, really, not an architecture department," Parsons says. "Computer-aided design lets students do more complete and modern projects that better simulate the real world.

"Even most of us on the faculty work on computers," the former naval officer adds with what could be seen as a wistful smile. "We don't need water."



The towing tank

Every child who has played in a bathtub has generated waves that test the tubworthiness of toy boats. At the U-M Ship Hydrodynamics Laboratory (a.k.a. "the towing tank") there is similar artifice, but it is far from child's play.

The towing tank is a high-tech facility where marine engineers automatically generate waves and use computerized sensing devices to put models of submarines, ore carriers, tuna seiners, barges and oil drilling platforms through their watery paces.

With its length of 360 feet, the tank is slightly longer than a football field; its depth is 12 feet. At one end is an electrical wave-making machine, at the other, an artificial beach to absorb the waves.

The tank — the first of its kind in a U.S. academic institution when it was built in 1903 — is still at ground level of the West Engineering Building at a corner of the Central Campus Diag. It's housed in a dimly lit cavern that echoes with the roaring sounds of the wave-maker and the carriage that moves along the length of the tank, towing model ships through the water at speeds accurate to .002 of a foot per second.

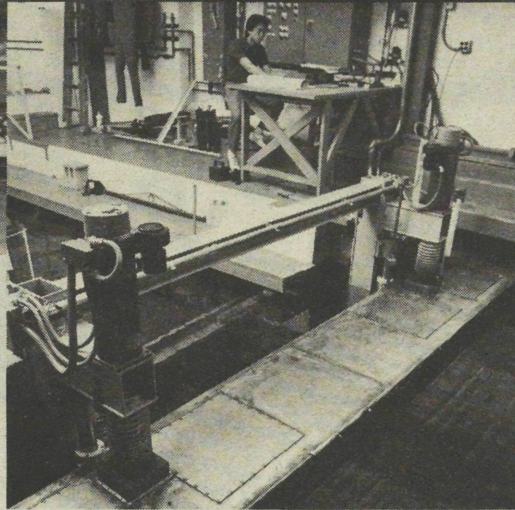
The offshore and shipping industries and the U.S. government hire the lab for a variety of tests and employ many of its students to conduct them. The models are harnessed to the carriage by a metal brace, which is in turn attached to sensors that feed information on force and resistance to a bank of instruments carried atop the carriage.

A video camera beneath the water can record data on the model as it encounters a variety of simulated aquatic conditions, from a placid river to a raging sea whose two-foot swells correlate with 100-foot sea waves and 90-mile-an-hour winds that can capsize an oil-drilling rig.

"We've tested almost 700 barges for the commercial shipping industry," says the lab's director, Prof. Armin Troesch. "A towed barge has a tendency to sway in its course. This must be controlled, especially in narrow channels like those in New Jersey, where tugs tow barges loaded with hazardous waste out to sea."

Open sea conditions, with waves coming from all sides, are impossible to create in the towing tank because of its bowling-alley proportions and single wave maker. Advanced computer programs, though, have recently been designed to simulate these conditions.

"You can design a vessel to withstand the worst conditions," Troesch says. "We've devised hinged models that can measure the bending forces on an ore carrier in a storm. But most large ships are destroyed by the failure of a small system. A storm shorted out the control panel of a huge cargo ship. It lost its automatic ballast mechanism and sank itself. It's quite probable that the famed Edmund Fitzgerald went down in Lake Superior not because of the severe weather but because a hatch cover was lost through human error or a seemingly minor manufacturing flaw."



ARMIN TROESCH, director of the Ship Hydrodynamics Lab where ships, yachts, oil rigs and other vessels and structures are tested in model form, says the wave machine (inset) can simulate almost any aquatic condition by generating regularly or irregularly spaced waves with up to two-foot crests — to a scale model, that can be like braving 100-foot breakers.

Efforts to determine the resistance of full-scale ships by studying towed models go back at least as far as Leonardo da Vinci, Troesch says, but the breakthrough in mathematical extrapolation did not come until British engineer William E. Froude's work in the 1870s.

Subsequent refinements permit calculations of a ship's resistance with an accuracy ranging from ± 1.5 to 5 percent by considering such variables as friction, wave-making resistance, wetted surface area, speed, drag, wave amplitude and frequency. Hull shape, horsepower and propeller and bow designs are but a few of the many characteristics studied in the hydrodynamics lab.

Like the engineering itself, the craft of making model ships, barges, drill rigs, yachts and propellers has grown increasingly scientific over the years. This demanding task is performed by lab craftsmen. Vessel models are wood, fiberglass or wax; the propellers, which can cost \$500, are constructed of bronze, aluminum or white metal.

The towing tank was renovated and refined at a cost of \$600,000 over the past six years. Troesch says several "unorthodox and inexpensive methods" help the tank operate on its approximately \$300,000 annual budget.

For example, the "beach" that helps absorb waves and calm the half a million or so gallons of water between tests is built from discarded truck grilles stacked two feet deep along the sloping floor at one end of the tank. They were a gift of the Ford Motor Company.

Plastic grilles aren't the oddest thing that the tank has seen. Goldfish cruise at one end of the tank, put there to clean algae off the dock area. And U-M students were once dunked in the tank for a Coast Guard test of life preservers. "The men jumped out of the 68-degree water in no time," Troesch recalls. "The women lasted a lot longer because they have more body fat."

And an appliance manufacturer once dragged washing machine parts through the tank to test a new method of painting.

Kit Boss, a native of Holland, Michigan, and an '83 graduate of Brown University, interned in the Office of News and Information Services last term while completing his master's degree in journalism at the U-M.

Bulbous bows

THE PHOENICIANS built ships with bulbous bows to ram ships. Warships were built with rams as late as the 1800s; even the battleship USS Michigan had one. "But when ships' guns became more accurate," Prof. Armin Troesch reports, "naval architects decided to get rid of rams because no one would get close enough to an enemy to use them."

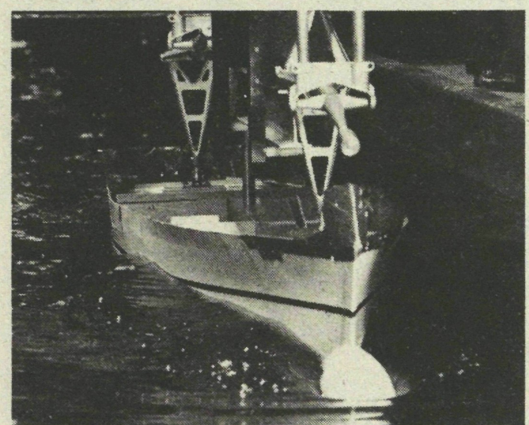
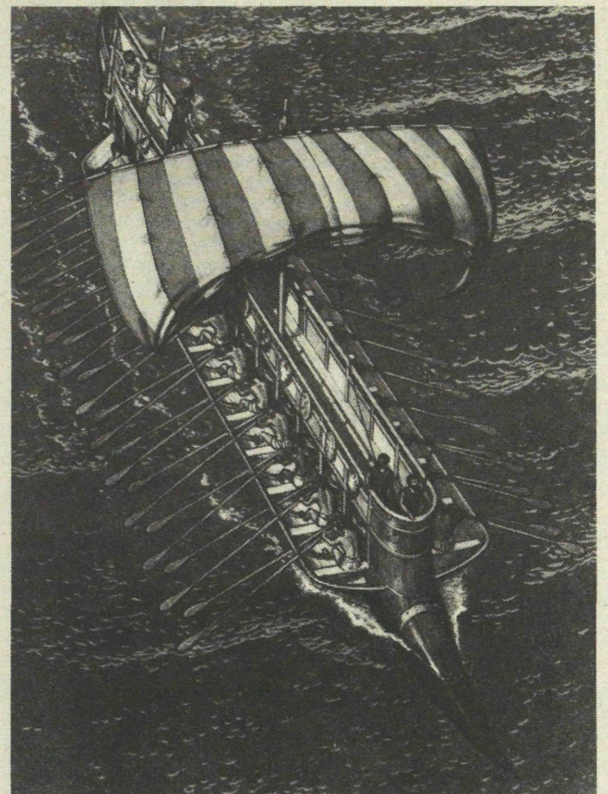
When shipbuilders removed the rams, however, they discovered the big vessels went faster with them than without. The U-M's Richard B. Couch, who was the head naval architect for the nuclear-powered carrier USS Enterprise and is now a professor emeritus, decided to study the ram, or bulbous bow, in the U-M hydrodynamics lab with a visiting expert from Japan.

Couch and his colleague discovered that bulbous bows create a wave that cancels the bow wave made by the rest of the ship and also streamlines the flow around the propellers and bilges.

Only since the 1950s, Couch says, have bulbous bows been used to cut drag and decrease turbulence below the waterline. The design reduces the horsepower needed to move a ship, increasing hull (the ship's body) efficiency by up to 25 percent, Couch found; but it is effective only at a certain speed, and it doesn't help sailboats.

Couch once studied the design of the ocean liner *The United States* for the U.S. Navy. The ship, which had a conventional bulbous bow (relatively small bulge), was, and still is, the fastest big commercial ship in the world. Now she's tied in dry dock, but when in service she could do 40 knots. By increasing the size of her bulbous bow, Couch discovered she could be even more efficient.

"Eventually, word of the study got back to William Francis Gibbs, who'd designed her," Couch recalls, "and he got mad as hell. He was violently against bulbous bows, I think because he once made a trip through rough seas on a boat with a bulbous bow and he got drenched by the bow spray while standing on deck. He blamed that on the bulbous bow. We were told to lock up that report."



Stellanova Brunt Osborn

A BRIGHT OLD STAR

Robert Frost

He came himself in answer to our ringing,
Opened the door for us and bade us welcome,
Yet with no word or smile — his eyes had spoken,
We had not so expected — we stood facing
A medium sort of man in size and age
(Could it be he?) in gray not too well-pressed,
His hair not over- tidy, a soft collar
To match his gray comfortable shirt —
We had not so expected to confront him,
And so we asked if it were he, and he
Said yes, and shook each of us by hand, and led
Us in. Welcomed by one small word we were at home.



ROBERT FROST on the Michigan campus in the '20s. 'He was kind and a bit rustic in his ways; perhaps he cultivated that,' Osborn says of the poet.

So begins the poem Robert Frost composed by Stellanova Brunt Osborn ('22, MA '30, Litt. D. '78) after she met the famous poet on the U-M campus in October 1921, the fall of her senior year.

Now 92 years old, the widow of the late Chase S. Osborn — a runaway boy who became a governor of Michigan and U-M Regent — lives in Sault Ste. Marie, Michigan. Although Osborn, who prefers to shorten her first name to "Stella," went on to achieve international prominence as an author, scholar and stateswoman, she still remembers the Frost year at Michigan as a milestone in her productive life.

From her writings and a series of interviews with Michigan Today's Pat Roessle Materka emerges the portrait of an energetic and indomitable woman.

Forced by circumstances to quit school and go to work at 15 in her native Canada, Osborn was 17 when she left Hamilton, Ontario, for the United States "after my employer refused to pay me the same wages as a younger boy." She worked as a stenographer and alternated between night and day school in Toledo, Ohio, finishing high school in 1913 at the age of 24. She then enrolled in U-M, where she was instrumental in starting one of the University's first "underground" magazines and planting the idea for a "poet in residence."

These events of her college years helped chart the course of her life-long endeavors and relationships. Osborn recalls them in the following story.

By Stella Osborn

I was a great "beef" in my generation, bursting with enthusiasm one moment, grumbling the next. I preached at myself conscientiously but with little effect from a 3-by-5 card stuck in the edge of my mirror at Helen Newberry residence: "Consume Your Own Smoke." My best friend and I lived in a state of perpetual discussion.

I had been working as a secretary at 30 cents an hour, 28 hours a week, and getting straight A's in all my courses, when I was appointed to the governing board of the *Inlander*, U-M's prestigious literary magazine. This was quite an honor for a freshman, and I was very excited.

In the fall of 1919 I went straight to the *Inlander* office to report for duty, only to find a note on the door that said "Discontinued." World War I had suddenly come to an end, and the Rhetoric Department had to marshal all its resources to accommodate the young men who were returning to school.

I was mad. Pouring out my frustration to my roommate, I noted to her that this great university had a good student newspaper, *The Daily*; a humor magazine, *The Gargoyle*, and *The Chimes*, which elaborated on football and how to make money in South America.

Somehow, in my earlier years, I told her, I gained the impression that what is now known as creative writing — expressing one's thoughts about birth and living and loving and God and dying — was a chief interest of a university. Now, at Michigan, there was only a deceased literary magazine and not even a five-dollar prize for writing.

"I've a notion to start a magazine myself!" I told my friend.

"Well, why don't you?" she challenged, calling my bluff. "It wouldn't cost much. You can cut the stencils and we can get two or three others to help with the mimeographing and distribution."

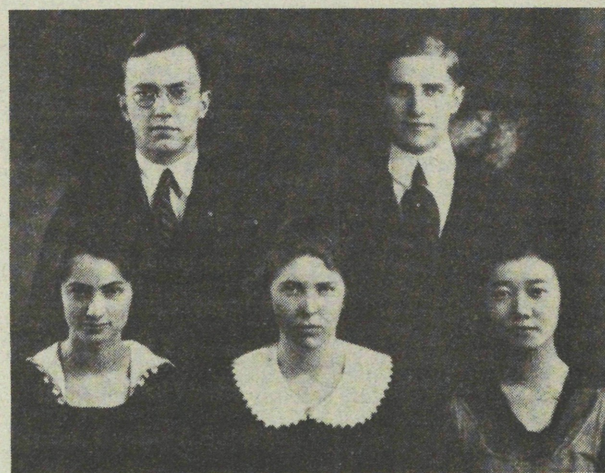
These were the days when an extra pat of butter for breakfast was considered a binge. Nonetheless, five of us — all women, I should add — undertook the task, and that winter we published the first edition of *Whimsies*, amateurishly dateless and conspiratorially anonymous. We sent them to President Marion Leroy Burton, all of the deans and the members of the Departments of English and Rhetoric.

When President Burton read our opening editorial complaining about the absence of encouragement for creative writing on campus, he took it up with the faculty, and they approached Robert Frost to be U-M's Poet-in-Residence for a fee of \$5,000. Chase Osborn, the former state governor and U-M Regent, agreed to supply the full honorarium.

Robert Frost, who was 47 then, spent 10 months on campus in 1921-22, my senior year. It



Photo by Liz Raffaele



THE WHIMSIES board in the '22 Michiganensian. Despite the male students in the photo, five women really started and ran the literary publication, recalls Osborn (front left).

was wonderful beyond our dreams. He was not there to teach any classes but to be a friend. He belonged to us students.

When my roommate and I were selected to greet him that first evening, we were very intimidated. He put us at ease immediately, referring to us as "little girls." He was kind and a bit rustic in his ways; perhaps he cultivated that.

This section of the poem I wrote soon after that meeting describes our conversation:

He stood framed in the fireplace talking to us,
In a dark fireplace, in a quiet room,
Asking us questions of ourselves and then
Telling in turn of things most pleasant to us:
Of men, young men he knew, who would be poets,
Who were true poets at heart — even with the pen!
Youths who were earnest, yet who feared the fun
Others might make of them for being poets
Since they were able-bodied and might fill
A man's-size job instead, who feared a laugh
So much that they must make apology
In every speech, perhaps even in the names
They gave their books including derogation.
"One in great earnest needs no mask," he said.
...Of our democracy
"It was on trial," he told us. "Over there,"
Europe he meant of course, "they hold us blinded,
Blinded by youth. But we should try it out
Ourselves and see...."

Each month, the *Whimsies* staff and a select group of students met with Robert at the home of Prof. and Mrs. Roy Cowden on Olivia Street for "Evenings with Frost." He showed us how a "real poet" worked: When he had an idea, he'd write it down and place it in a folder to finish at some later time. Two pithy phrases of his I'll always remember are: "I'd take that statement with a bag of salt" and, "Everyone should have at least one minor vice. Mine is tea."

He did not hesitate to point out weaknesses in our poetry or prose. He said my prose was too rhythmic, that it made him feel "well, sort of sick." I knew what that meant, but said I didn't seem to be able to avoid it. "Well, if you realize it and can't stop it, then perhaps that's something that makes you different — so just forget about changing it," was his final advice.

I remember distinctly where he stood in front of the Helen Newberry Residence when he took three of my poems from his coat pocket. They were terribly serious — black, tragic. "You have something, that's plain," he said, "but something else will have to happen to you before I can take your writing to a publisher and say: 'Look what I have found.'"



FORMER GOVERNOR of Michigan Chase S. Osborn and Stella Osborn in 1940. A monument to the governor was planned to be dedicated June 15 at the Sault in the Locks Government Park.

I can recall only one visit to the Plymouth Road home of the Frosts. Mrs. Frost did not appear. (I saw her only a few times during their stay and have no memory of her having ever said anything, though her fine, lovely, lovable face was not that of one who had nothing to say.)

The ostensible purpose of that visit was to ask for a poem for *Whimsies* or for myself. He brought

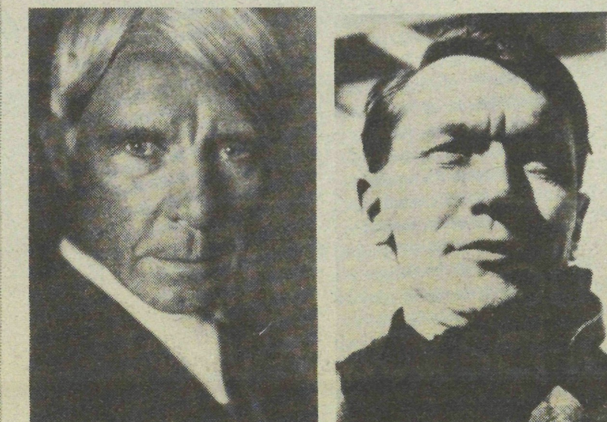
out a brown accordion-pleated file, remarking that he did not accept as ready for publication poems as he first finished them. He did the best he could at the time, then "put them in cold storage."

Once we discussed whether it was plagiarism for a poet to use a particular scheme of rhyme or rhythm from another poet. Forms belong to all poets, Robert declared; the only question might be as to their appropriateness for their subjects.

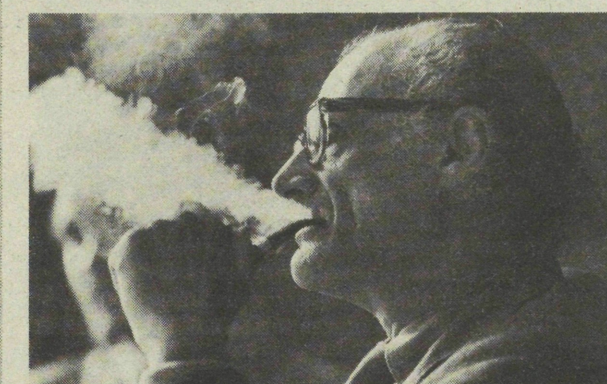
When a new form came to a poet out of the past or present, he said, the poet can pick it up, analyze it, practice it a bit and, when at last it was his, "store it away in the attic." Whenever a subject began to haunt him, Robert said he would go to that attic full of forms and "try on one after another" till he found one that would fit best, "just as one would try on hats."

Whimsies' first editorial brought not only Robert Frost to campus that year, but ten of his poet friends. I remember only a few: Carl Sandburg, Padraic Colum, Amy Lowell, Louis Untermeyer, Jean Starr Untermeyer and Vachel Lindsay.

Sandburg and Lindsay at that time seemed more entertainers than poets, but both were memorable, like medieval minstrels brought back to life as Americans. Sandburg reached heights that some thought equal to Frost's. Lindsay was a lonely soul; I heard on good authority that Sara Teasdale loved him but could not adjust to his eccentricities.



CARL SANDBURG (left) and Vachel Lindsay 'seemed more entertainers than poets, but both were memorable, like medieval minstrels brought back to life as Americans.'



ARTHUR MILLER later occupied the shoes created at Michigan for Robert Frost, thanks to the miracle of the Hopwood writing awards.

Years later, on a visit back to Ann Arbor, Robert Frost asked me what had become of all the aspiring poets he had met at the University. He speculated that the 1940s had been difficult years for poets, "the decade in which they discovered they were not what they thought they were, and left the world of the imagination to do practical things to change the world." This seemed to classify me among the lost poets.

There is reason to believe, however, that Robert Frost was kinder to the minor birds in his Ann Arbor days than he was in his later days at the Breadloaf Writers Conference, when at times he openly and sharply expressed his impatience at having to bother with such stuff as he found in his basket — though the writers were paying a good price for his bothering and some of their work was authentic.

Or should poets, whose working hours are notoriously irregular, ever be tied down to contracts and timeclocks? One complaint about Frost at Breadloaf was that one morning he did not show up because of his deep hurt when frost killed his flowers.

At Michigan, a number of men students interested in writing took long walks in the woods with Robert Frost. He may have had in mind this inequality of opportunity for women when he remarked that he was always sorry for women who wanted to be poets.

Overcoming this disability was one of the featherers in the caps of my schoolmates Sue Grundy Bonner and Mary Cooley who, after being escorted home by Robert, decided to turn right around and escort him home.

EPILOGUE

Stella Brunt wrote a letter of thanks to Chase Osborn for making it possible to have Robert Frost on campus and sent a copy to U-M President Burton with the suggestion that the University solicit funds from other writers to initiate a creative writing award.

Her suggestion ultimately resulted in the gift that created the Jule and Avery Hopwood Writing Awards, still the most prestigious awards the University gives to student writers.

The correspondence between Stella Brunt and Chase Osborn grew into a deep and unique friendship. Separated from his wife, "the Governor" (as she still refers to him) adopted Stella in 1931 as his secretary, collaborator and daughter. Together, they led the drive for building the Mackinac Bridge joining Michigan's Upper and Lower Peninsulas and wrote close to a dozen books, including *Schoolcraft-Longfellow-Hiawatha* about the early American ethnologist who studied the Indians of the Great Lakes, and *The Conquest of a Continent*, a history of the boundary between Canada and the United States.

The governor was 34 years older than she, but they were kindred spirits, sharing a love of the outdoors, Michigan history and literature. They married in April 1949 after the death of his first wife, whom he had not divorced for religious reasons. Two days later, he died at 89.

"My gifts matched his weak points," Osborn says. "We were ideal collaborators. The wonderful thing is that his name and his means enabled me to carry on his life's goal, to unite the democracies."

This political goal led the Osborns to join the Atlantic Union at its birth, and she remains permanent honorary vice president of the Washington, D.C.-based Association to Unite the Democracies, the current name of this international organization which was a precursor of the North Atlantic Treaty Organization. In recognition of her work as an international stateswoman, Osborn received an honorary doctorate from the University in 1978.

In 1922, as she was receiving her B.A. in English, Robert Frost marched in the same procession to accept his honorary master's degree. Four decades later, she told Prof. Erich Walter, assistant to U-M President Harlan Hatcher, that Frost had confessed to her that it had disappointed him not to have received an honorary doctorate during his year on campus.

"That can easily be remedied," Walter told her, and in April 1962, Osborn and other old friends of the poet joined him at Inglis House after the commencement at which he received his long-coveted honor. The poet died only a few months later.

Browsing in Inglis House that day, Osborn picked up Our Michigan, the collection of alumni appreciations of the University that Professor Walter had compiled. She came upon the piece by the playwright Arthur Miller ('38). That experience prompted these observations:

POSTSCRIPT

Now, many years later, I can add a last word as a postscript to the piece by Arthur Miller. As a dropout after high school in Depression-struck Brooklyn, he had nothing but dreams of being able to write about things that perhaps no one but himself had seen.

He read about the University's incredible Hopwood Awards. The idea that a university cared that much about writing made it necessary to go there. Isn't it exciting that Arthur Miller later taught at the University, occupying the shoes created at Michigan for Robert Frost?

Isn't it more than exciting — more than dramatic — isn't it a miracle to have that frail *Whimsies* flower into the Robert Frost and Jule and Avery Hopwood combination that changed the University that seemed not to care at all about student writing into the University that cared the most in all the world (award-wise, at least), so that the dropout it attracted for the development of his gift could come back and be the heart of its creativity for a spell, as Fellow in Creative Writing?

Cloth has wings for architect Kent Hubbell — but bricks just don't fly

FABRIC ARCHITECTURE

By Terry Gallagher

Lateres non volant ("Bricks don't fly"), the Latin motto under Kent Hubbell's corporate logo, explains why Hubbell makes buildings out of cloth: because buildings made from traditional construction materials don't move him the way fabric structures do.

Since the late 1960s, Hubbell has tailored new glad rags for some of America's favorite public spaces.

In the heart of Pittsburgh, an inflated yellow shelter that looks like Paul Bunyan's air mattress shields the stage used for the Three Rivers Arts Festival.

In Baltimore, Hubbell's canopies cover a system of bridges in that city's redeveloping waterfront.

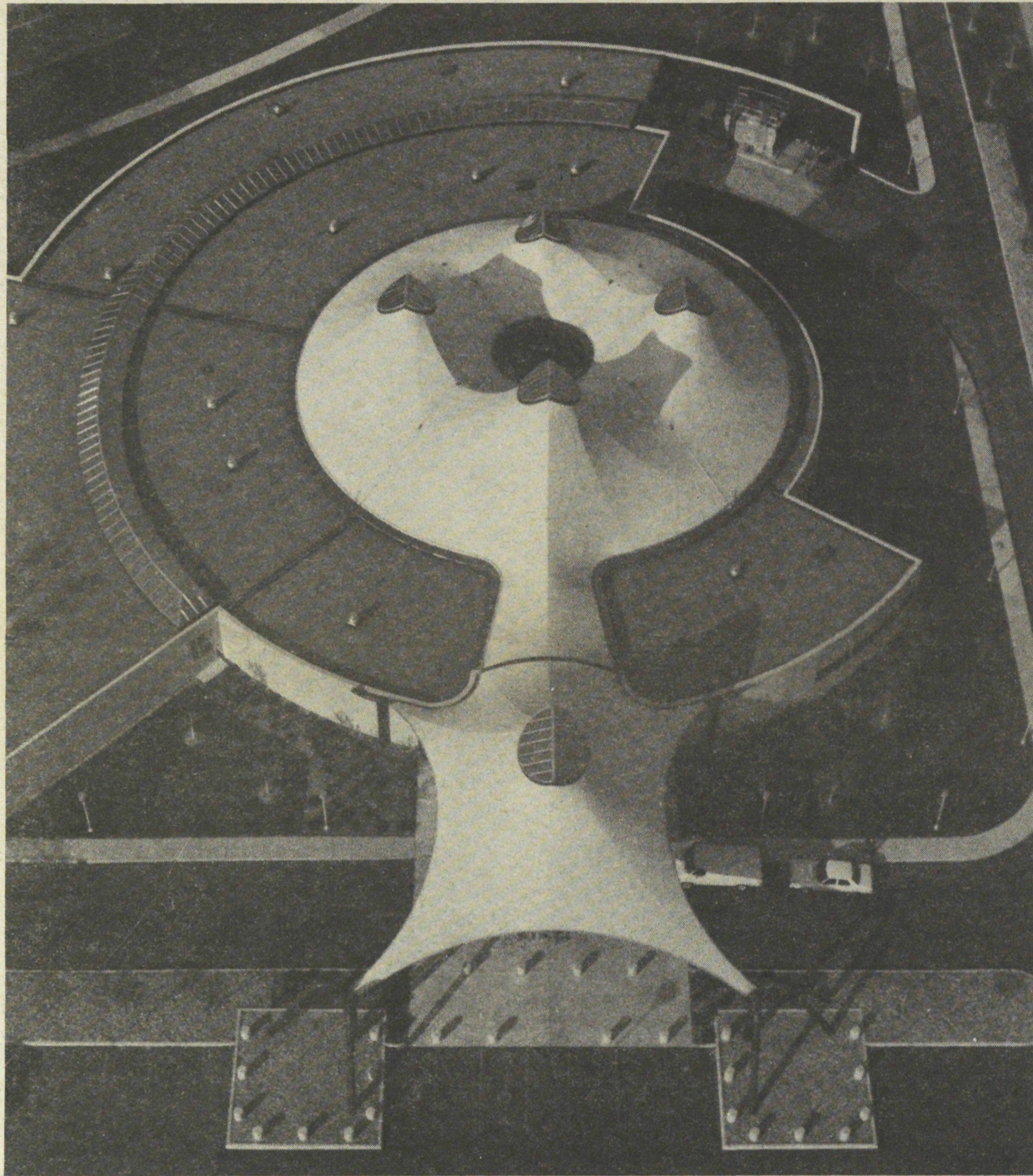
The fortress-like battlements of Detroit's Kennedy Square have been relieved by a yellow nylon tent that Hubbell designed "to provide a spot of shade and bright color in the middle of a gritty downtown area."

Hubbell has made fabric buildings in studio exercises with his graduate students in the University's College of Architecture and Urban Planning, and he also builds them as part of his private practice, originally known as Chrysalis East, now called Kent L. Hubbell, Inc.

Although light-heartedness is one of the trademarks of fabric buildings, Hubbell is serious about their place in an academic curriculum. The ease in fabricating and installing cloth buildings makes them attractive projects for student architects, he says, allowing them to see the progress of a design from blueprint to occupation.

In Hubbell's U-M classes such work is a mode of inquiry, as valid and as useful as any other scholarly tack. "Our approach to architecture is not doctrinaire," he says. "We are empiricists experimenting with new shapes and different materials to create new knowledge for the profession."

"Event structures," the brightly colored, whimsically curved edifices that serve as both signage and shelter for short-term public events, have been the mainstay of Hubbell's work. But innovations in materials and in construction techniques over the last decade have moved fabric nearer the architectural mainstream, where it is taking its place alongside other building systems.



HUBBELL DESIGNED this 14,000-square-foot fabric roof for the central section of the East Area Health Center in Detroit. "The building's owners were looking for a dramatic, conspicuous image," he says. Among the most technologically sophisticated fabric structures, its outer shell is Teflon-coated fiberglass. Then come two layers of insulating material and a sheet of fabric for the inner layer. Steel masts support the structure, opening into skylights that bathe the public space in shadowless natural light. Photo courtesy of Balthazar Korab Ltd.

KENT HUBBELL is interested in the applicability to architecture of the ideas of German philosopher Martin Heidegger, especially in his book *Being and Time*.

"The essential question is how Heideggerian philosophy projects itself upon the built environment," Hubbell says. "So many ideas that are literary or philosophical need some corollary in the physical world."

Heidegger's philosophy holds that basic truths of human existence are embodied in the common, obvious features of everyday life but are often overlooked because they are too near to be grasped.

In Hubbell's interpretation, the everyday qualities of human experience are reflected in "an architecture derived from everydayness," in the buildings people use without self-consciousness. He cites his recent design for a small building in Ann Arbor's Farmer's Market. "It's meant to be as durable as blue jeans, as hardworking as a farmer: That's what I mean by everydayness," Hubbell says.

The architecture of 'everydayness'



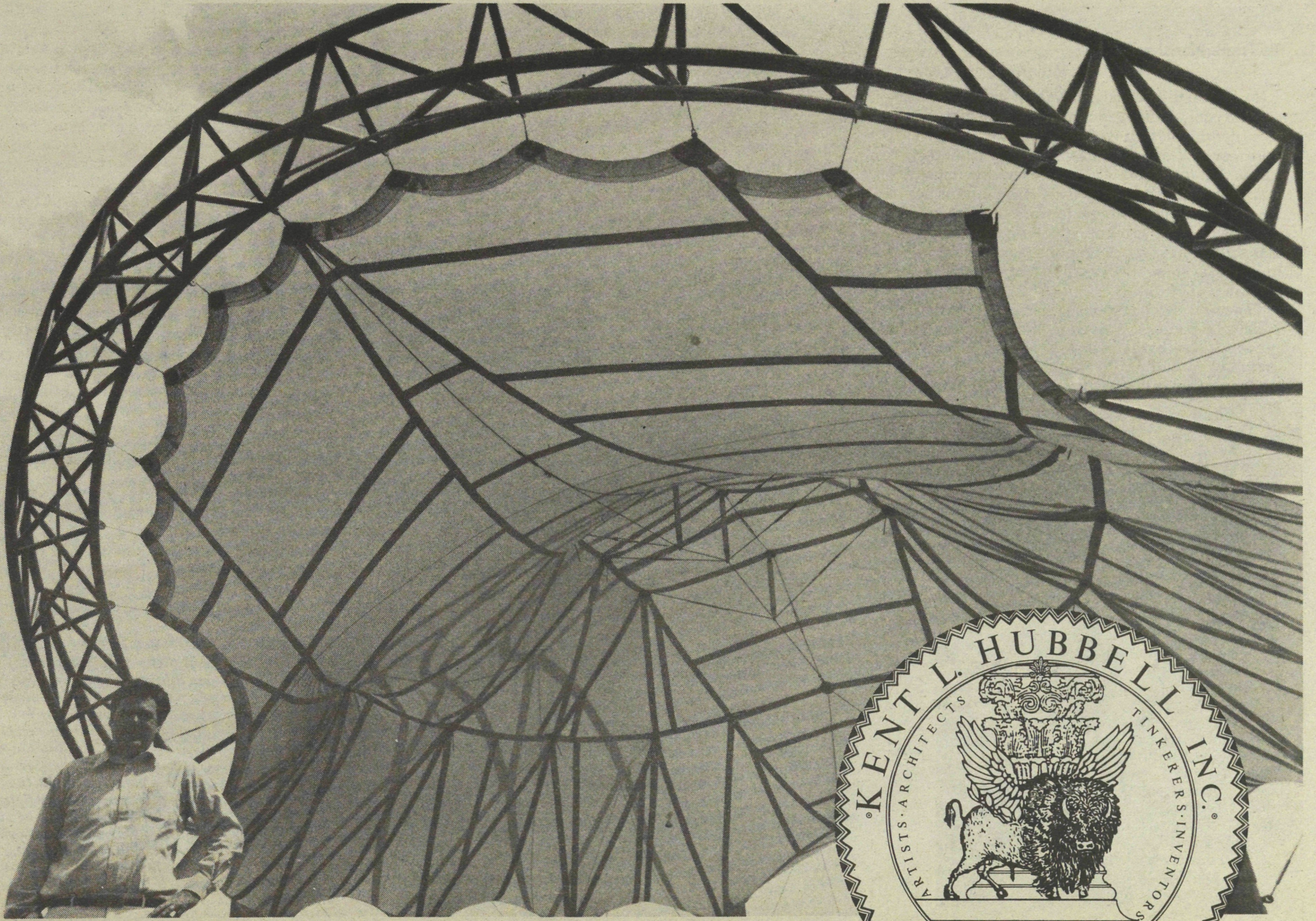
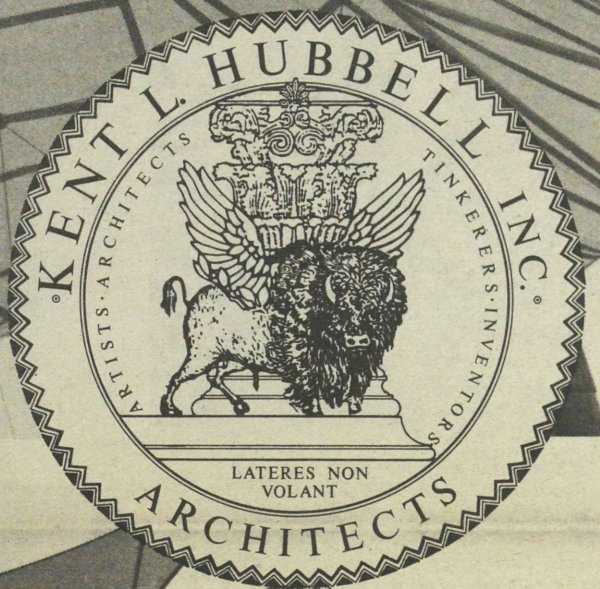


Photo by Terry Gallagher



A 1985 National Academy of Sciences report concluded that "tensioned fabric structures offer an important alternative" to conventional construction. "Improvements in materials, structural analysis and environmental controls," the report said, "allow fabric structures to be considered as permanent buildings."

Hubbell agrees. "These are not necessarily temporary items," he says. A bandshell he designed for Chene Park on Detroit's riverfront can hold 35 pounds of snow per square foot and withstand 85-mile-an-hour winds, which compares well with the endurance of conventional materials.

Although the long and storied history of fabric buildings includes wigwams, yurts, pup tents and the circus big top, Hubbell says that modern fabric structures first appeared after World War II as shelters for radar antennas on the Distant Early Warning line in northern Canada. Besides being radar-transparent, these structures were attractive for the same reasons that fabric buildings are today: They were light in weight and easy to ship and install.

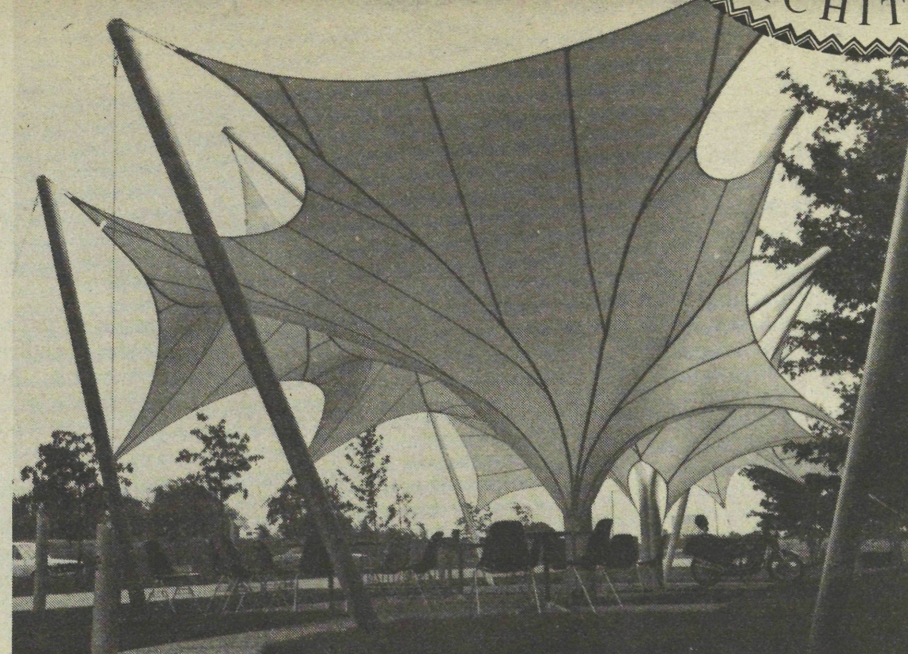
Architects experimented with fabric designs through the 1950s, but drew no serious interest until the '60s, when Frei Otto's Institute for the Study of Lightweight Structures opened in Stuttgart, West Germany. The United States' pavilion at the 1970 Osaka World's Fair and the facilities installed for the 1972 Olympics in Munich marked the flowering of that interest, according to Hubbell.

Today, the biggest roof in the world covers a 105-acre airport terminal in Jidda, Saudi Arabia, with 5.5 million square feet of fabric. Other places using fabric for shelter include shopping centers in California, orchestra pavilions in Tennessee and sports arenas in Michigan.

Although Hubbell uses "everything from sailcloth to Teflon-coated fiberglass," recent developments in cloth-like materials have opened the field to new designs and accelerated the success of fabric structures.

In general use now are composites of woven substrates protected with applied coatings. In such composites, the substrates range from common nylon to Kevlar, a high-strength material that stretches very little and resists temperature extremes.

Fabric surfaces can be coated with a variety of films, including neoprene, polyvinyl chloride or



"THESE ARE not necessarily temporary items, Hubbell says of fabric structures. The bandshell above in Detroit's riverfront Chene Park can hold 35 pounds of snow per square foot and withstand 85-mph winds. At left, one of Hubbell's canopies shields the outdoor dining area of the Herman Miller furniture firm in Zeeland, Michigan."

Teflon, which seal the fabric against weather, protect against ultraviolet light and hold the fabric panels together. By mixing and matching fabrics and coatings, designers can adapt the qualities of the materials to many applications.

One particularly promising development is the adoption of silicone as a coating. More flexible and translucent than Teflon, silicone is self-cleaning and extremely durable. The extra translucence of silicone is an advantage in cold-climate uses, where solar radiation is desirable.

In most permanent fabric structures, the fabric is only one component, generally the roof, in a complete building. Although a fabric roof is not much cheaper than conventional materials, savings can be realized in installation and start-up costs. Since a great deal of the work on such a structure can take place inside a factory remote from the building site, work schedules and quality are easier to control, and little time need be lost to bad weather.

Often, however, there is a trade-off in energy costs between fabric and conventional structures: Savings gained from the reduced need for artificial light are offset by increased heating requirements.

Speculating on the future of fabric buildings, Hubbell says, "They could be as transitory as music, or they could be a universal solution to the architectural problems of the modern world."

He recalls visionary architect R. Buckminster Fuller's design for a see-through dome covering Manhattan from 22nd Street to 64th Street, and the Hudson to the East River. Thinking it less expensive to air-condition an entire city than to heat and cool individual buildings, Fuller calculated that his design would reduce the energy loss of Manhattan fifty-fold. The exposed surface of the dome would be only 1/50th the size of the heat-radiating surfaces of the buildings it enclosed.

Such a dome would pay for itself in 10 years through the savings in snow-removal costs alone, Fuller predicted.

A similar application of fabric design may have applications in space colonization, Hubbell says. An enormous fabric shell, perhaps of some new membrane that harnessed solar energy, could encapsulate a space station, controlling the internal atmosphere and protecting the colony from cosmic debris.

As Hubbell points out: "You couldn't do that with bricks."

By Frank Blanchard

Turn up the heat and humans will drip sweat to cool off. Soybean plants, on the other hand, will trap water by shutting their pores, or stoma, that release moisture from their leaves. But look closer, much closer, down inside their cells. Here both soybeans and humans behave alike as they struggle to ward off damage from rising temperatures, invoking what scientists call the heat shock response, an apparently universal system of survival that can be traced to the dawn of life.

"The heat shock response must be one of the first behavioral patterns evolved in life on this planet," says Frederick Neidhardt, professor of microbiology and immunology at the U-M Medical School. "It is activated by an increase in temperatures in hundreds of different species."



IN 1981, research associate Ruth Ann Van Bogelen joined Neidhardt in demonstrating for the first time that bacteria react to heat shock in the same way as cells of higher organisms. Their discovery promises to shed light on such other cellular processes as growth and the synthesis of DNA, RNA and proteins.

A Parade of Living Things

Over the past 25 years, the heat shock response has been found in a parade of living things spanning the scale of evolution — bacteria, fungi, corn, tobacco, soybeans, tomatoes, butterflies, fruit flies, sea urchins, trout, amphibians, chicken, quail, rats, hamsters and humans.

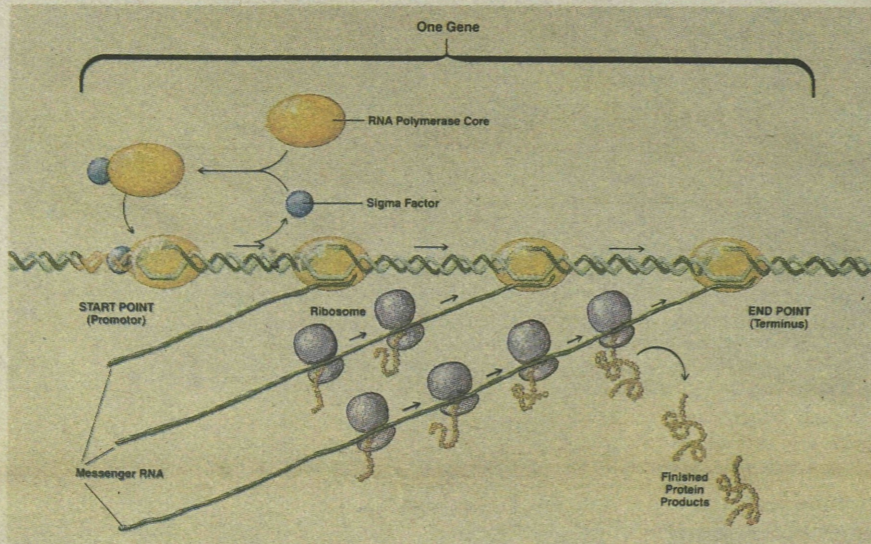
The cells of each of these plants and animals react dramatically in the presence of heat. Most cell functions cease, except for the feverish production of a handful of heat shock proteins that apparently protect against damage at high temperatures and then help restore the cells to normal when the heat subsides.

"In general, the prominent heat shock proteins of

THE HEAT SHOCK RESPONSE

A cellular reaction to high temperatures shows a degree of kinship among all living things

HOW CELLS MAKE PROTEINS



PROTEINS ARE the products of genes, and they make up fully half of the mass of all living things. They are catalysts that determine the rate and course of all biochemical activities. A protein molecule is made of hundreds of amino acids linked in a chain that is folded on itself. The order in which the 20 common amino acids appear in the chain determines how it will fold; the chain's final shape determines what activity the protein will possess. The process of making a protein begins with a DNA gene, from which RNA polymerase, a special enzyme, makes an RNA copy. This RNA molecule, called messenger RNA, is a working copy of the gene; it is used by ribosomes (protein-making particles in all cells) to direct the synthesis of the particular protein. This illustration shows a few molecules of RNA polymerase in the act of making messenger RNA from a typical cellular gene in the bacterium *E. coli*. Ribosomes have started using the still-incomplete messengers to begin synthesizing the gene's protein product.

Cover and other illustrations by Shekinah.

different organisms show structural and behavioral similarities," Neidhardt says. "Even though the general pattern and time-course of the heat shock response is similar from bacteria up to humans, it was surprising to find strong similarities among the heat shock proteins of all living organisms, similarities that point to a common primitive origin."

How the heat shock proteins do their work remains a mystery that scientists worldwide are laboring to solve. They want to know the mechanics of the response, the function of each heat shock protein in the group of proteins that protect the cell. They also want to know why the response has endured evolution for millions of years, even in organisms like humans, which maintain a nearly constant internal temperature. Besides contributing significantly to scientific understanding, such information would have a practical value extending far beyond the laboratory.

Medical and Agricultural Uses

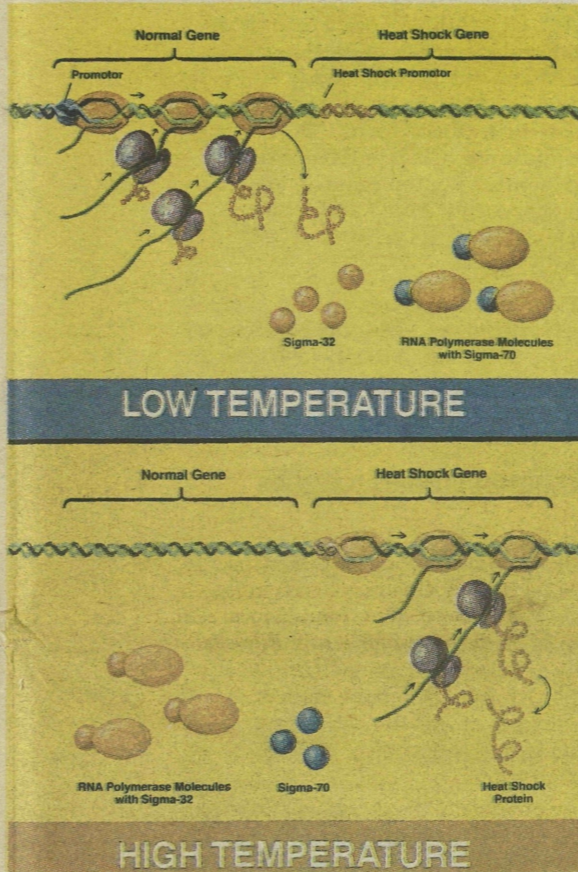
For example, an understanding of heat shock could be used in agriculture to prolong the survival of food crops in a heat wave. Doctors could refine the technique of raising the temperature of cancer cells to destroy tumors, and the medical profession could gain a deeper understanding of the general effect of temperature on cell health.

The current investigation of the heat shock response revolves around proteins, the microscopic building blocks of life, the catalysts that determine the rate and course of all biochemical changes. Proteins, which account for half the mass of all living things, are produced in a process that begins with DNA (deoxyribonucleic acid), the molecular basis of heredity in many organisms, and RNA (ribonucleic acid), a substance key to protein synthesis.

DNA, which resembles a twisted rope ladder, splits down the middle as if each rung had broken in half. Each DNA strand is divided into segments called genes. Each exposed half rung on the gene is called a base. There are four kinds of bases, adenine (A), thymine (T), guanine (G) and cytosine (C). The sequence of bases along the gene, called the genetic code, determines the sequence in which amino acids will link together to form a particular protein.

For the genetic code to be useful in protein synthesis, it must be communicated from the DNA to the cell's protein makers, which are called ribosomes. To convey the code, a special enzyme, RNA polymerase, causes molecules of messenger RNA to attach weakly to the exposed half-rungs of the DNA (see illustration "How Cells Make Proteins"). The molecules of messenger RNA form their own chain opposite the DNA, temporarily restoring the appearance of a twisted rope ladder. The messenger RNA (an exact copy of the DNA and carrying its genetic code) then breaks away from the DNA and drifts to the ribosomes, which use it as a blueprint to make a protein.

HOW HEAT SHOCK RESPONSE IS TURNED ON



A SIGMA FACTOR, predicted and discovered by U-M researchers, controls the heat shock response in *E. coli* by programming RNA polymerase to build proteins mainly at the site of heat shock genes. The upper illustration shows the array of genetic material at normal temperatures. The illustration below shows that when the new factor, sigma-32, becomes activated in some way by a rise in temperature, it dominates the factor that is operative at normal temperatures (sigma-70), and a greater number of molecules of core RNA polymerase become programmed to read only the special start signal (promoter) of heat shock genes. The higher the temperature, the greater the rate of production of heat shock messenger RNA molecules, perhaps because sigma-70 becomes less active at higher temperatures.

RNA polymerase performs a vital function in this process by identifying the point along the DNA strand where the gene begins. RNA polymerase is made of five subunits, four bound together as a core and one — sigma factor — bound to the core, where it helps the core recognize the beginning of each gene. The sigma factor enables the polymerase to bind to a particular sequence of bases, called the promoter, which indicates the start of the gene. The sigma factor leaves the core of the polymerase after assuring that a proper start has been made.

Neidhardt's study of heat shock has centered on the bacterium *Escherichia coli* (*E. coli*), which is the most widely researched single-cell organism in biology because it grows quickly and easily and yields readily to analysis by the techniques of genetics and biochemistry.

In 1981, Neidhardt and his colleague and research associate, Ruth Ann Van Bogelen, discovered heat shock in *E. coli*, demonstrating for the first time that bacteria react to heat in the same way as cells of higher organisms.

Because bacteria are simpler than plant or animal cells, Neidhardt and colleagues in Wisconsin, Utah and Japan were quick to discover a new sigma factor that controls the heat shock response in *E. coli*. The finding paves the way for learning whether the heat shock response is controlled in the same way in other organisms. The new factor, called sigma-32, is less than half the size of the normal sigma factor, now called sigma-70, but it binds more strongly to the core of RNA polymerase. A rise in temperature somehow spurs

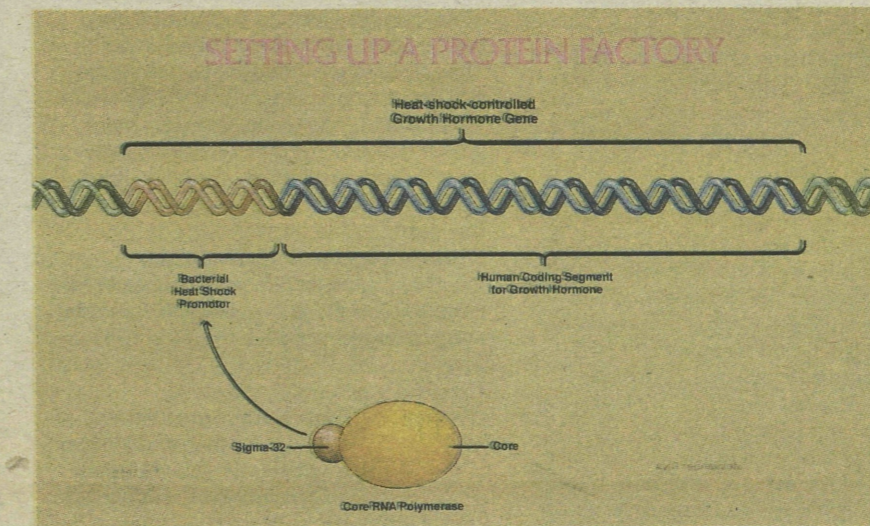
others turned down." At 50 degrees Celsius (122 F), *E. coli* makes only heat shock proteins, a fact that leads Neidhardt to foresee at least one commercial spinoff from his research: a new way of modifying cells to make them produce large quantities of such proteins as hormones and enzymes for medical use.

For years, genetic engineering has been used to modify cells so they will manufacture desired proteins. Genetic engineers use proteins called restriction enzymes, which are known to break strands of DNA at specific points. By using a combination of enzymes, a gene or group of genes can be clipped out of the DNA of one species. Using another set of enzymes, these defined segments of DNA can be spliced into the existing DNA of a different species. The foreign genes will function in the new species because the genetic code is essentially the same for all organisms.

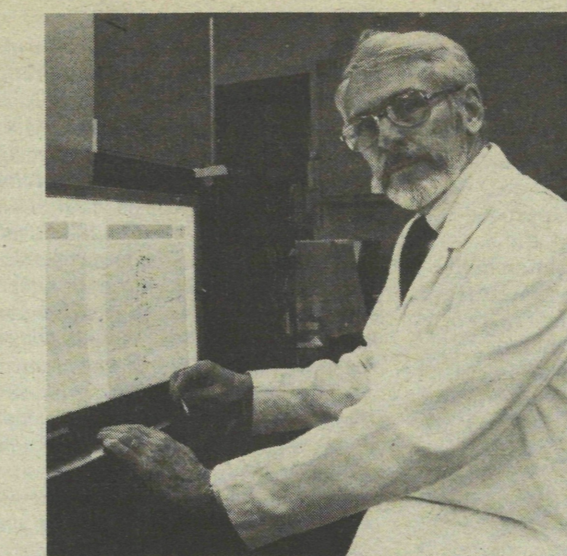
For example, human genes that carry the code for producing a hormone can be snipped from human cells and spliced into *E. coli* cells, which are easily grown and manipulated. The *E. coli* cells will then manufacture the human hormone.

One drawback to this technique is that large quantities of a foreign protein tend to retard the growth of *E. coli* cells. This problem could be overcome by finding a way to delay activating the human gene until after the *E. coli* cells have grown and proliferated enough to make the production process yield worthwhile amounts of the hormone.

Scientists have been using a chemical method of de-



SPlicing ANE. COLI heat shock promoter in front of a gene for the human growth hormone illustrates how an organic 'protein-manufacturing' process might someday be efficiently controlled by temperature. The special sequence of gene segments (bases) characteristic of heat shock promoters and recognized by the heat shock regulator, sigma-32, is known. By test-tube splicing, this sequence could be placed immediately in front of the coding sequence of a desired gene, such as the human gene for growth hormone. Introduction of the engineered gene into *E. coli* cells should lead to the construction of *E. coli* cells that can be grown in large numbers at a low temperature, where the engineered gene is inactive. Raising the temperature would gradually shift cellular activity, turning off production of non-heat shock genes and turning on the heat shock genes — and with them, the human gene for production of growth hormone.



Frederick Neidhardt

sigma-32 to dominate the weaker sigma-70 and program a greater number of molecules of core RNA polymerase to read only the special starting points, or promoters, of heat shock genes. The effect of sigma-32 increases with the temperature.

Neidhardt has also pinpointed 18 of *E. coli*'s heat shock proteins and learned something about the function of eight of them.

"The proteins of the *E. coli* response include several that appear essential for growth, possibly at all temperatures, but their roles in these processes are largely unknown," Neidhardt says. "The proteins identified so far appear to be involved in many of the major macromolecular processes of the cell, for example protein synthesis, protein degradation, RNA synthesis, DNA synthesis and protein processing."

The heat shock response is immediate (see illustration "How Heat Shock Response Is Turned On"). Within seconds of an increase in temperature, the synthesis of heat shock proteins accelerates to rates many times above those before the increase, and the acceleration varies with the magnitude of the temperature shift.

"Except at extremely high temperatures," Neidhardt explains, "this rapid synthesis lasts no more than 20 minutes, following which the rates decline to new steady-state values characteristic of balanced growth at the elevated temperature. The higher the temperature, the more the heat shock genes are turned up and the

laying the human gene, but this approach is expensive and inefficient. The heat shock response might be harnessed to improve this manufacturing process, Neidhardt says.

"One could simply splice the *E. coli* heat shock promoter sequence in front of a gene of interest — such as the human growth hormone gene — thereby disguising the gene as a heat shock one. [See illustration 'Setting Up a Protein Factory'.]

Then the *E. coli* cells containing the engineered gene could be grown at a temperature below that which induces the heat shock response, and the human gene could be turned on to any desired level of function simply by allowing the temperature of the container in which the cells are growing to increase to a pre-set level."

Advantages of this technique include the ability to fine-tune the rate at which the hormone is manufactured in order to achieve a maximum yield from one batch of cells. The heat shock technique would also enable scientists to almost shut down the competing activity of the thousands of other genes in the cell.

"The *E. coli* cells might even be further genetically manipulated to prevent them from making their own normal heat shock proteins at the high temperature," Neidhardt says. "Genetic engineering of this sort is an easy thing to do."

Investigators of the heat shock response have identified a number of stress factors besides heat that also provoke the response, although less intensely. They include exposure to oxidizing agents, drugs, steroid hormones, viruses such as herpes simplex and, in *E. coli*, ethyl alcohol.

"In bacteria as in higher organisms, the heat shock response confers increased resistance to the deleterious effects of high temperature and ethyl alcohol, but how this is brought about is not understood," Neidhardt says. "In brief, the evidence shows increased survival of cells exposed to lethal doses of these agents if the cells are first exposed to mild heat shock-inducing conditions. The preponderance of evidence suggests that synthesis of the heat shock proteins is necessary for the development of this transient tolerance."

"We can now see more fully how cells respond to stress," he adds. "And we are on the verge of discovering new levels of cellular organization that permit coordinated responses of genes. Our suspicion is that by learning how cells respond to physical and chemical stress, we will learn how cells accomplish other complex activities, such as growth and cell division, which require coordination of hundreds of reactions."

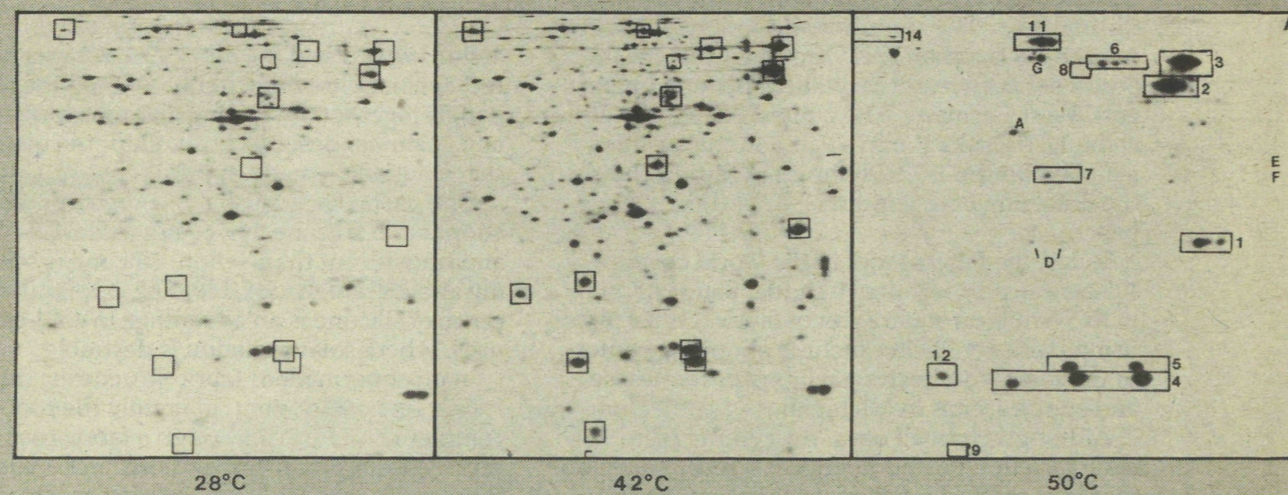
The Gene-Protein Index

Professor Neidhardt's study of the heat shock response has relied heavily on a project begun 10 years ago in his laboratory — the construction of a huge catalog that will eventually list information about all of the nearly 2,000 proteins of the *E. coli* cell and the genes that determine their makeup.

The project, supported by the National Science Foundation, is expected to be completed long before a similar catalog can be constructed for any other living cell.

The task is possible mainly because of the pioneering work of Patrick O'Farrell. As a graduate student at the University of Colorado in 1975, O'Farrell published a description of a technique by which all cellular proteins could be spread out onto a chart with horizontal and vertical coordinates for examination. In this mapping technique (see illustration), the pattern of protein spots and the size of the spots will be the same for any given cell, accurately reflecting the abundance of each protein in the cell.

Neidhardt set up a system to classify each protein with respect to a reference gel, making it possible to compare gels run in different laboratories. Then he asked scientists from around the world to donate both purified samples of *E. coli*



A TWO-STEP method of gel electrophoresis is used to spread out all the proteins in a cell onto a sheet of paper. The location on the paper indicates the kind of proteins that are present, and the darker the spots, the greater is the protein's abundance. The technique uses an electromagnetic field to sort the proteins and array them two-dimensionally by their electrical charge and size (molecular weight). The photograph at left shows the protein spots of an *E. coli* cell at 28 degrees C (82 F). Spots in the boxes are the heat shock proteins. The middle photograph shows the proteins produced when a mild heat shock is induced at 42 C (108 F). Here the heat shock protein spots are darker, indicating a greater abundance than normal. At 50 C (122 F), severe heat shock is induced; heat shock proteins are produced in even greater amounts, and the production of most other proteins is halted, as the absence of other spots indicates. Greater understanding and control of this phenomenon promise both a deeper theoretical understanding of life processes and many applications in bioengineering.

proteins and strains with genetic changes in individual proteins to help him learn which spot corresponded to each known protein. The work is still under way.

By combining gel separation with recent advances in genetic engineering, Neidhardt expects to compile a complete index of all *E. coli* genes and proteins. When finished, this gene-protein index will describe all of the 1,800 to 2,000 proteins normally found in the living *E. coli* cell (plus another 500 that can be made under particular environmental conditions) and will indicate the chromosomal location of their genes.

Although only one-sixth finished, the gene-protein index is already valuable. Neidhardt is using it to study cellular responses to stress, such as heat (see main story). Other scientists studying the cells of higher organisms are finding it useful for many purposes, including:

- Observing detailed molecular reactions of whole cells to external stimuli,
- Finding the corresponding gene of an identified protein, or the corresponding protein of an identified gene,
- Simplifying the cloning of genes,
- Investigating how particular proteins operate in the cell,
- And identifying and studying the overall cellular response to stimuli.

Neidhardt's gene-protein index is "a very fundamental and important advance," says John Ingraham, a bacteriologist at the University of California at Davis. "Essentially it allows you to look at all the proteins in the cell and to see how these change under various conditions."

LETTERS

'Sacred Rage' reconsidered

WHILE your March issue wins points for providing faculty scholars an opportunity to comment on the Middle East, the superficial views of Robin Wright hardly warrant such prominence. When she recommends "sensitive understanding" of Shia fundamentalism, she implies acceptance of irrational fanaticism. Scholars like Bernard Lewis or Conor O'Brien lack no understanding of the Shias, whom they perceive as dangerous to themselves and others, an endemic political hazard until Shiites elect to change themselves. In *The Siege*, O'Brien sees no hope of exacerbating the Muslim's "sacred rage" against secular humanism. His most optimistic forecast conceives of a "tacit accommodation" like that between Jordan and Israel, conceding nothing but accepting a *modus vivendi*.

Marcus M. Rosenblum
Sarasota, Florida

ROBIN WRIGHT'S incisive perceptions about the Middle East astounded me. They were so frighteningly astute and objective that rather than merely continue to condemn *Middle Eastern* terrorism, we, as Americans, should look at ourselves for the behavior we project to incur such wrath. It's not such a bad, or unpatriotic, thing to do.

If our leaders had a little humility instead of public bravado, maybe we as a nation would realize the many American offenses we have inflicted on the area — both militarily and culturally — and understand the continuing conflict in the Middle East better. We seem to forget that there are always two sides to every coin and that every coin does not always have Washington's face on it! One other comment: In the last paragraph describing Ms. Wright's background and Middle East experience, *Michigan Today* writes: "A fervent commitment to export their [the Shia] concept of revolutionary Islam . . . continues today as an influential force in regional and international politics. Mixed with this despair, this ENTHUSIASM has inflamed not just the Shia fundamentalists but other Shia and Sunni Muslims as well." I doubt that the writer of the paragraph could so consciously choose such an appropriate word to describe the passion that drives these people. An enthusiastic person is one that can be defined as one who is "possessed positively or negatively by a god." In this case, the god is the Ayatollah Khomeini and everything anti-American he stands for.

Karil L. Kochenderfer
Washington, D.C.

IF *Sacred Rage* is an example of what is taught in the schools of journalism, we may just as well give up reading newspapers. Robin Wright makes wild generalizations without substantiations, draws conclusions without facts. Her book is a thinly disguised propaganda polemic in defense of the terrorists and their sponsors. It reminds me of the apologists for the Third Reich, who said if we only deal with the Germans in an understanding way everything will be all right. Well it was, millions of lives later and the destruction of much of what was worthwhile. What we must do with terrorism is to have less understanding and more will to annihilate them.

Titus C.R. Mendell
Detroit

THE UNDERLYING attitudes expressed by such writers as Robin Wright [in "Sacred Rage," March '86 issue] and Prof. Geoffrey H. Eley [in U.S.-Soviet summit preview, October 1985] reinforce the theme that the United States is always at fault and we do not understand the Soviets, Communism and now the Moslems. Dr. Di Giulio '35 commented (March 1986) to the point on Eley's article, but Wright's article necessitates an answer. She quotes Moorhead Kennedy: ". . . a number of the students swarming in to take our embassy in Tehran had looks of rapture on their faces." I saw similar looks of rapture on Nazis as they committed their bestial acts and murders, and on Soviet, Chinese and other Communists as they perpetrated, and still do, their denigration of human life and murder of tens of millions of people in cold blood. Rapture in the name of fanaticism and vice is no virtue! The theme of Miss Wright that we do not understand the Arabs and Moslems is the same as the Michigan professors' vis-a-vis the Soviets (March 1984).

The United States and the Western world must realize that we are facing a Moslem world that lives by a simple creed. That is, that Christians and Jews are *dhimmi* people, second-class status under Islamic rule. That is why no meaningful Christian community exists in the Moslem world and the last remnants are being destroyed in both Lebanon and Egypt. The present-day Moslems in the Middle East have turned the driving force of our times to that of 1,300 years ago after their defeat by Charles Martel at the battle of Tours in 732. Millennia of progress have been destroyed. Under Wright's thesis of our need for rapprochement and those she quotes like Kennedy and Ball, how can they sit silent to the murders of 20,000 men, women and children in Homa, Syria, by Assad, for 50 years the slaying of every Palestinian leader who expressed even an interest in rapprochement with Judaism and Israel, the wanton rape of Christian Lebanon in the '70s by the PLO, the unforgivable behavior of Khomeini in sending the flower of Iran's children and youth to their death as human mine sweepers, the endemic attitude of anti-Semitism under the guise of anti-Zionism as practiced by the Moslems and their Soviet mentors and sponsors, etc.?

The heritage of "Sacred Rage" is a lack of understanding of all the above; she wants us to kneel to those who have taught a generation of children and now adults to kill before they can even read. Why do the lead articles in *Michigan Today* give credence to the "evil geniuses" of our age, such as the Soviet leaders and the Moslem leaders I've mentioned above, either directly or by inference? Can't we have lead articles giving a favorable view of the United States and Western civilization, the greatest mankind has produced?

Bernard W. Gamson, M.S. Chemical
Engineering '39
Potomac, Maryland

THE STATEMENTS by Prof. Raymond Tanter in connection with "Sacred Rage" about the authenticity and sincerity of some Moslems are too broad and sweeping. Unless he has been reading their minds, and is competent to make such judgments, perhaps "judge not" would be better. Certainly some, if not all Moslems, because that is what their own writings themselves say, evidence a very high degree of seriousness.

Victor W. Gladstone
San Bruno, California

WRIGHT reveals a narrow perspective by her implication that Americans need only to understand that the Muslim world has legitimate grievances. From the American Indians to Hitler's National Socialists, America has dealt with a variety of people who believed, often correctly, that they had legitimate grievances. What they believed has never been particularly important, however things may look to a youthful Middle East reporter. What has mattered is whether they used unacceptable tactics. Those who attack America, however just they consider their cause, can expect that their movement will be destroyed, and their heroes will be remembered only as objects of ridicule. It would be tragic for this to happen to Islam.

William J. Roberts
Toledo, Ohio

THE EXCERPT from Robin Wright's book helps us to understand the nature of militant Islam.

Unfortunately, the author also appears to ask of us that we equate knowledge with sympathy, and in the end it is the Western victims of the holy terror who with their peoples and governments are summoned to the prisoner's dock. Hitler and his German supporters also were possessed by their "sacred rage." Then, too, those individuals and peoples who were compelled to bear the blows of wrath were made to feel that they were guilty for having provoked the aggression of their tormentors. A policy of appeasement became the means to quiet the storm.

It is not necessary to demean Ms. Wright's real achievement to suggest that *mea culpa* is not a policy likely to engender success on terms which the West can accept.

Hans Heilbronner '49, '50, '54
Professor of History
University of New Hampshire
Durham, New Hampshire

ROBIN WRIGHT REPLIES:

I was originally reluctant to allow just an excerpt of Sacred Rage to appear in any publication, in part because of possible misperceptions by readers who did not have the benefit of the whole work. In the first eight chapters I explained in detail the involvement by Muslim extremists in various terrorist acts, several of which killed friends and colleagues. I do not mean to suggest that the U.S. is always totally guilty, but rather that our record in the region — and elsewhere — is not always totally clean. Note 20 years of American support for Ferdinand Marcos, our ongoing support of Zaire's ruthless Mobutu and other Third World dictators, and a still wishy-washy policy after more than 30 years of apartheid in South Africa.

One of the major problems is perception. Americans tend to wipe the political slate clean every four or eight years with new administrations relegating policy mistakes or mishaps to history. But to outsiders, our actions are usually perceived in continuum. The CIA's involvement in putting the Shah back on the throne in Iran in 1953 is perceived as part of the same aggressive policy that led U.S. warships to open fire in 1983 on Muslims in Lebanon (at a time when American lives were not in danger). I do not mean to be an apologist for Islamic fanaticism or to advocate appeasement, but rather to implore better understanding of the root causes of a major threat facing the U.S.

I abhor any form of violence, be it in Nazi Germany or the Middle East — although to simplistically equate the two is to make a fundamental and potentially dangerous mistake. Understanding different cultures and experiences is pivotal to understanding different motives for violence. And knowledge does not mean sympathy, but it does help develop strategies that are more realistic and effective long-term rather than just emotionally and momentarily satisfying. After eight years of war, a former Lebanese prime minister said: "The Lebanese now want justice. The problem is that, for most Lebanese, justice now means revenge." The foreign policy of a mature and confident superpower should not be based on a "Rambo" approach that amounts to stooping to the level of our adversaries.

Osborn classmate

I WAS delighted to find in your March issue a letter from Stella Brunt Osborn. [See page 4 of this issue — Ed.] She was an outstanding member of my class, one of a small but fortunate group who were privileged to meet for several evenings at the homes of either Robert Frost or Prof. Roy Cowden not only with Frost, but with Carl Sandburg, Amy Lowell, Vachel Lindsay, Padraic Colum, Louis Untermeyer and, later, with the Poet Laureate, Robert Bridges. It was a time, thank God, when intelligibility, and even rhyme, were still in fashion.

Forman Brown '22, '23
Hollywood, California

'Rich' memories

SMALL COMMENTS on "That's Rich!": Wonderful memories of Professor Mueschke — he not only knew every student by voice, he knew every footnote — my textbook reads, "1934, Dorothy Goldsmith, Class of 1935." With fond memories of the years of Soapy Williams, Arthur Miller and Jerry Ford (even though I never understood football).

Dorothy Feinberg '35
Southfield, Michigan

Trombonist studies tongues

YOUR splendid publication is very useful when I go out to substitute-teach in the Muskegon County and Grand Haven Schools. Just yesterday, I sent the article "How to Learn a Language" (August 1985) to a former trombone student of mine who is now in the U.S. Army studying linguistics.

Albert L. Werner
School of Music '60, '63
Muskegon, Michigan

Regents' roster update

WOULD you please update your roster of U-M Regents, which in the March 1986 issue omits the name of Veronica Latta Smith of Grosse Ile, who took office in January 1985. Her local fan club is umbraged. Thank you.

Lee Clark '44
Grosse Ile, Michigan

We apologize for mistakenly using an old computer file for our last Regents' listing and then failing to pick up the error during proof reading. This also resulted in the omission of Regent Neal D. Nielsen of Brighton. We regret any confusion or umbrage this caused — Ed.

3 strikes on one caption

THERE WERE several mistakes in the caption to our drawing by Arshile Gorky which you produced on the back of your March issue. The artist's name was misspelled "Archile," the word "artist" was misspelled (a typo, I assume), and the correct medium is "tempera," not "tempura," which is the food.

Hilarie Faberman
Curator of Western Art
U-M Museum of Art

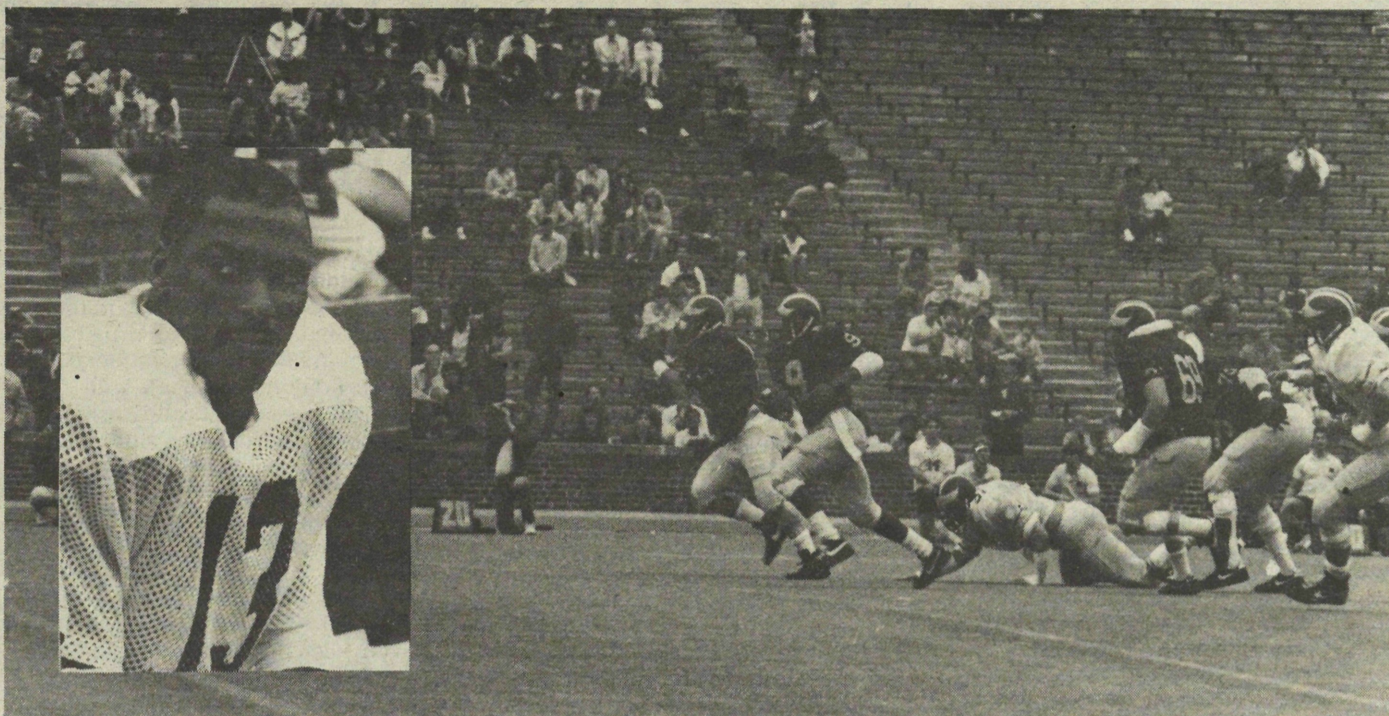
Tempera or tempura, with either substance we have egg on our face. — Ed.

Gainj article intriguing

THANK GOODNESS for Paul Lay (alumnus, '56)! He lent me his copy of the March 1986 issue and I enjoyed it enough to wish I were one of the alumni, too. I was especially intrigued by "Blood of the Gainj," by Pat Materka. Actually, every article was wonderful. Thanks to Paul Lay and The University of Michigan. Now! How do I get on the mailing list?

Sarah Grant Ross
Director of Nursing
Webster University
St. Louis

Non-alumni may get on the MT mailing list by request — Ed.



AN OPEN FIELD lies before freshman quarterback Michael Taylor in the annual spring game between the White and the Blue. Taylor's squad fell 18-13, however, before a White squad led by second-string quarterback Chris Zurbrugg, halfback Jamie Morris and preseason All-American defensive back Garland Rivers (inset). Jim Harbaugh led the Blue with 155 yards on 13-for-19 passing; Morris darted for 110 yards on 24 carries for the Whites, and Rivers killed a Blue drive with an interception. Photo by John Woodford

Ideas about 'God'

YOU MUST have been short of news to use two full pages on "Who Killed God" in the March issue. How does your article relate to news of Michigan University? Perhaps it provides a convenient forum for expression of your own tenets. Yes, "so may we all run into trouble."

Alice Porter
New York

I'M CONCERNED, but not surprised, that the great University of Michigan who prides itself on searching out the wonders and orderliness of the universe would condone the suggestion that anyone "Killed God" and the insinuation that He does not exist. Not surprised because the Holy Spirit who spoke through the prophets and apostles said that as man increased in knowledge they would "become vain in their imaginations — professing themselves wise — they became fools." Romans 1, Verses 19 and on as long as you dare read. Especially Verse 28: "And even as they did not like to retain God in their knowledge, God gave them over to a reprobate mind . . ." By the way, these same prophets and apostles knew about and understood all about predestination and foreknowledge centuries before John Calvin wrote about it.

John A. Vanden Hoek
Grand Rapids, Michigan

THANK YOU for underlining a Sign of the Times ("Who Killed God?"): "For men shall be lovers of their own selves, covetous, boasters, proud, blasphemers, disobedient to parents, unthankful, unholy, without natural affection, truce-breakers, false accusers, incontinent, fierce, despisers of those that are good, traitors, heady, high-minded, lovers of pleasures more than lovers of God . . . having a form of godliness but denying the power thereof . . . ever learning, and never able to come to the knowledge of the Truth." (II Timothy 3)

"For what if some did not believe? Shall their unbelief make the faith of God without effect?" (Romans 3:3)

A Word of Warning: Woe unto you, any unbelieving authors, editors, script-writers, "for ye shut up the kingdom of heaven against men: for ye neither go in yourselves, neither suffer ye them that are entering to go in . . . Ye have omitted the weightier matters of the law: judgment, mercy and faith . . . Ye blind guides, which strain at a gnat and swallow a camel." (Matt. 23)

A Word of Comfort: Truth CAN be verified, not by public opinion polls, but only by those who diligently SEEK it without fear of finding it.

Rosemary Michelmann Lebowitz '52
Hoonah, Alaska

PROF. JAMES Turner has written an extensive historical review of a development and arrived at a conclusion similar to that which others of us have come to in past, often less scholarly, considerations of the subject. Some of the message of his book has been raised earlier, I believe, by church historians, even in books and articles aimed at lay-members (for example, *What the Bible Can Mean for You*, Reginald W. Dietz, Muhlenberg Press 1962).

Others who can recall the Scopes Trial of the 1920s may have concluded, as I had, that Sen. William Jennings Bryan, in his emotional attempt to defend *what he thought* was biblical and biological teaching, did more to damage Judeo-Christian religion than an entire crew of atheists had in the years before.

Some years ago, an acquaintance of mine, a professor of religion in an Eastern U.S. college, had his students conduct a door-to-door survey. So-called fundamentalism of the fire-and-brimstone variety was widely preached and broadcast in the area. The survey revealed that several thousand people had been so turned off by this type of message that they had no desire to enter a church again — a result that is more of what Turner found. In a real sense, in spite of their also being prisoners of their times, just as we are of ours, Aquinas, Calvin and Luther had a far better conception of God than did many of the theologians following them: They realized the futility of trying to reduce God to being a product of our own rationalization, someone whom we have "all doped out!" The Hebrew writers of the Scriptures similarly did not have the narrow conception of God which crept into much post-Reformation theological thinking — thinking which tied God to a particular avenue of action deducted by them.

It is not too difficult to accept Turner's thesis about the growth of atheism and agnosticism. However, one has to ask if the same atheists and agnostics have not then fallen into a jaw of the same trap that clutches many believers: A pre-rationalization of what the Bible is saying; a failure to note there the concept that God is simultaneously "He who is closer than a brother, yet who dwells in unfathomable darkness." I don't know if Turner would agree or not.

Reynold E. Holmen '37, '49
White Bear Lake, Minnesota

THOSE WHO would like a more compressed answer to the question, "Who Killed God?" ought to look again at Henry Adams's poem, *Prayer to the Virgin of Chartres*. It is not only compressed but also a key to the fullest meaning of Professor Turner's concluding paragraph.

Sister Rose Marie Laiken M.A. '44
Duluth, Minnesota

I RELISHED John Woodford's review of Professor Turner's book. It was like an invigorating fresh breeze in this period of reactionary regression. The philosophers and scientists referred to fought a verbal mystical universe. They opened doors to reason and rationality. Even today, however, I wonder what warps and restraints the coined words of our progenitors may have upon our scientists. Could our scientists be suffering from the tyranny of words? Let us not overlook that when the Torahs, Bibles and Korans were written by man, mankind was at the mercy of dreaded fears of the unknowns. The unknowns became threats demanding placating. At that time the most rudimentary facts with which to attempt an understanding of the simplest phenomena did not exist. Man's instinct for survival, his self-centeredness and his ego could not admit of not knowing. In desperation he filled the vacuums of the unknowns with creations of his imagination to which he applied and coined words. Eventually the *word* became the *reality*. These word-realities persist to this day and are fought over.

Aarre K. Lahti
U-M Professor Emeritus of Design
Cedarville, Michigan

IT WAS surprising to find the article "Who Killed God" displayed so extravagantly. Both the book and the review are exercises in futility. We know that many philosophers of note have wrestled with the question of our world's origin, and how it came to have the beautifully planned order of all things affecting animate and inanimate life. In the book and the review men like Paine, Franklin and Jefferson are mentioned as having such concerns but not as having convictions. Then Charles Norton and Thomas Hardy are presented as promoting "the distinctively modern unbelief" and the "inability to accept the reality of God." Rather oddly, the author is then quoted as finding that religious belief and church-going remain strong "during this intellectual crisis and still are so."

The author reportedly thinks he finds an oddly mixed bag of influences, other than the thinking of philosophers, that have affected belief in God. Starting in the mid-1800s, these include capitalist economic development, technological advancement, rapid urbanization, the rise of slums, scientific discoveries. The effects of influences such as these on our belief in God can only be a matter of opinion. It would seem that the author would agree because, in his conclusion, he reportedly says, "The universe is not tailored to our measurements. Forgetting that, many believers lost their God." So we can answer the question in the title — God is not dead. Asking that question is, in our opinion, a little like a small boy questioning whether he really had a mother.

John E. Goodwillie '20
Delray Beach, Florida

ALUMNI CENSUS

1 9 8 6

The University of Michigan

According to responses to the Alumni Census 1986, many U-M alumni "have maize and blue corpuscles," spent "the best years of my life at the University," met their spouse while in school and still send a rousing "Go Blue!" back to campus.

Mailbags full of responses to the Census questionnaire, which was mailed in late March, have been arriving since April. So far the response rate has climbed above 35 percent.

In August, a second mailing will be sent to alumni who did not respond to the first survey. Alumni who may still have their questionnaires are encouraged to return them right away so that it won't be necessary to contact them a second time.

Staff members have been sorting through the incoming questionnaires, entering information into the data base and selecting some for response where appropriate. Although the majority of the respondents have a positive attitude toward the University, some do have concerns, and these are being noted. Recommendations for improving various services, comments on University policies and remarks about specific Schools and Colleges are being forwarded to the appropriate units.

Many alumni have asked for a report on the Census. There will be a full feature story in *Michigan Today* once the survey is completed. However, returns from the second mailing will not be fully recorded until December 1986, and statistical analyses cannot begin until after that. It will probably be next spring before material will be available for publication.

In the meantime, any questions about Alumni Census 1986 may be addressed to Gerlinda S. Melchiori, Administrative Services and Census Project Director, 6018 Fleming Building, The University of Michigan, Ann Arbor, MI 48109.



AT THE DEDICATION of new facilities for the Economics Department in April, President Harold T. Shapiro (left) recognized Sumner and Laura Foster for their generous support. The Fosters' gift provided furnishings and core endowment for the Economics Library, which was named in their honor. A member of the National Campaign Committee, Sumner Foster also serves as area chairman for the Boston special gifts Campaign program.

UPJOHN SUPPORTS U-M RESEARCHERS

The Upjohn Company has pledged \$2 million to the University to be divided between U-M's Upjohn Center for Clinical Pharmacology, the College of Pharmacy and the Department of Chemistry.

The pledge will go toward The Campaign for Michigan, U-M's five-year effort to raise \$160 million in private funds for endowment and selected facilities projects.

"The Upjohn Company is very pleased to participate in helping to strengthen the academic excellence of The University of Michigan," said R. T. Parfet Jr., chairman of Upjohn's board and chief executive officer. "This \$2 million grant further demonstrates Upjohn's strong interest in the quality of higher education."

U-M President Harold T. Shapiro said, "We are delighted by the news and very grateful for this expression of confidence from the Upjohn Company. This significant new commitment is a source of encouragement to the entire University community."

The total Upjohn gift will be payable over five years. From it, a \$1 million endowment fund will be created for the Upjohn Center for Clinical Pharmacology in the U-M Medical Center. The income from the fund will be used

to improve and maintain the research facilities and to fund innovative studies.

The Upjohn unit specializes in trials of new drugs and studies of drug combinations and their efficacy under controlled conditions in patients with specific diseases or in healthy volunteers. An average of seven studies each involving between 10 and 28 persons is under way at any given time.

The College of Pharmacy will receive \$500,000 to establish another endowment fund. The interest will provide Upjohn Fellowships in Pharmaceutics for doctoral candidates, to help meet a growing need in industry and academia for scientists trained in pharmaceutics. About 100 research scientists, postdoctoral scholars, research associates and graduate students currently are involved in the College's research program.

The Department of Chemistry will receive \$500,000 to construct and equip medicinal chemistry research space in the new chemical sciences building to upgrade the University's leadership capability in this field. The project will include a major renovation of the existing building and the addition of 270,000 square feet of new construction. The \$60 million building will be funded from a combination of public and private sources.

ENGINEERING RECEIVES TWO MAJOR GIFTS

Two U-M College of Engineering departments have recently received Campaign gifts totaling over \$2.1 million — \$500,000 from the Boeing Company of Seattle and computer equipment worth slightly more than \$1.1 million from AT&T.

"Boeing's support," said Thomas C. Adamson, chairman of the Department of Aerospace Engineering, "reflects their understanding of the importance of the U-M program to the aerospace industry and the need for private support for new facilities to keep up with modern experimentation." A number of Boeing engineers have graduated from the U-M, he added.

The AT&T computer equipment will be used by faculty, staff and students for research, training and experimentation in the Department of Electrical Engineering and Computer Science. The gift includes 21 microcomputers, three minicomputers and one mainframe, as well as 42 terminals and UNIX software.

ALL-ALUMNI EFFORT TO BEGIN

The All-Alumni Effort, Phase II of The Campaign for Michigan, will kick off this summer. In this program, all 260,000 graduates of the three campuses of The University of Michigan will be asked personally to support the Campaign through gifts to the schools and colleges from which they graduated.

Presently, about 50,000 alumni are donors to the University. It is hoped that through this all-alumni phase of the Campaign that number will double, Campaign leaders announced.

Gifts will be used for a variety of purposes including scholarships, fellowships, equipment, pilot and special research projects, faculty support and building renovation.

Already, many alumni have made generous gifts and pledges to the Campaign and have taken on leadership roles as Campaign volunteers. Progress toward the \$20 million goal set for the separate all-alumni effort will be tracked in future issues of *Michigan Today*.

SCHERING-PLOUGH CREATES PHARMACY SCHOLARSHIP FUND

The U-M, the Plough Foundation and the Schering-Plough Foundation are creating a \$1.5 million endowed scholarship fund for U-M pharmacy students, with initial awards of up to \$3,000 per student to be given in early 1987.

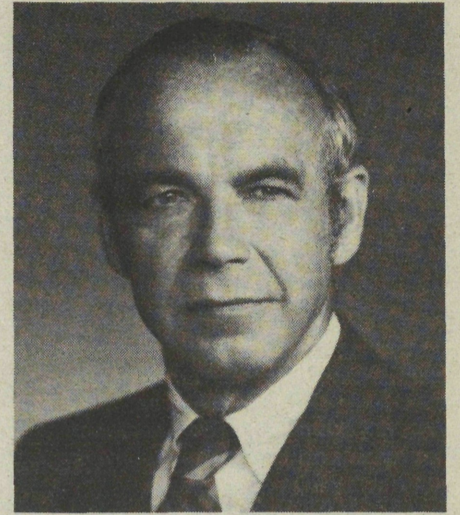
The University and the two private foundations each will contribute \$500,000 to the fund over the next 11 years. A combined total of \$150,000 in initial installments was made to the fund last month.

"At a time when the costs of pharmacy education are rising dramatically, the Plough Pharmacy Student Scholarship Fund will provide us with the opportunity to offer financial assistance to a significant number of students enrolled in the professional doctor of phar-

macy program at Michigan," said Ara Paul, dean of the College of Pharmacy. "We are indebted to both the Plough Foundation and the Schering-Plough Foundation for this generous endowment."

Selection criteria for the scholarship will include academic performance, leadership, good citizenship and financial need.

The Plough Foundation was created by Abe Plough, founder of Plough Inc. of Memphis, a major mass merchandiser of widely known consumer products. In 1971, Plough Inc. consolidated with the Schering Corp. to form the Schering-Plough Corp., a research-based manufacturer and marketer of pharmaceuticals and consumer products.



John R. Edman

EDMAN LEADS MAJOR GIFT EFFORT

U-M alumnus John R. Edman has been named national chairman for major gifts for The Campaign for Michigan. Edman is vice president and group executive, Finance Group, with the General Motors Corp.

To date, approximately \$119 million, or 74 percent, has been raised toward the \$160 million Campaign goal.

Jon Cosovich, vice president for development and communication, said Edman had accepted this new post at a key point in the Campaign. "Now at the three-quarter mark," Cosovich noted, "we are entering the final phase of the Campaign. Mr. Edman has the expertise to help push this last leg of the Campaign to a successful completion."

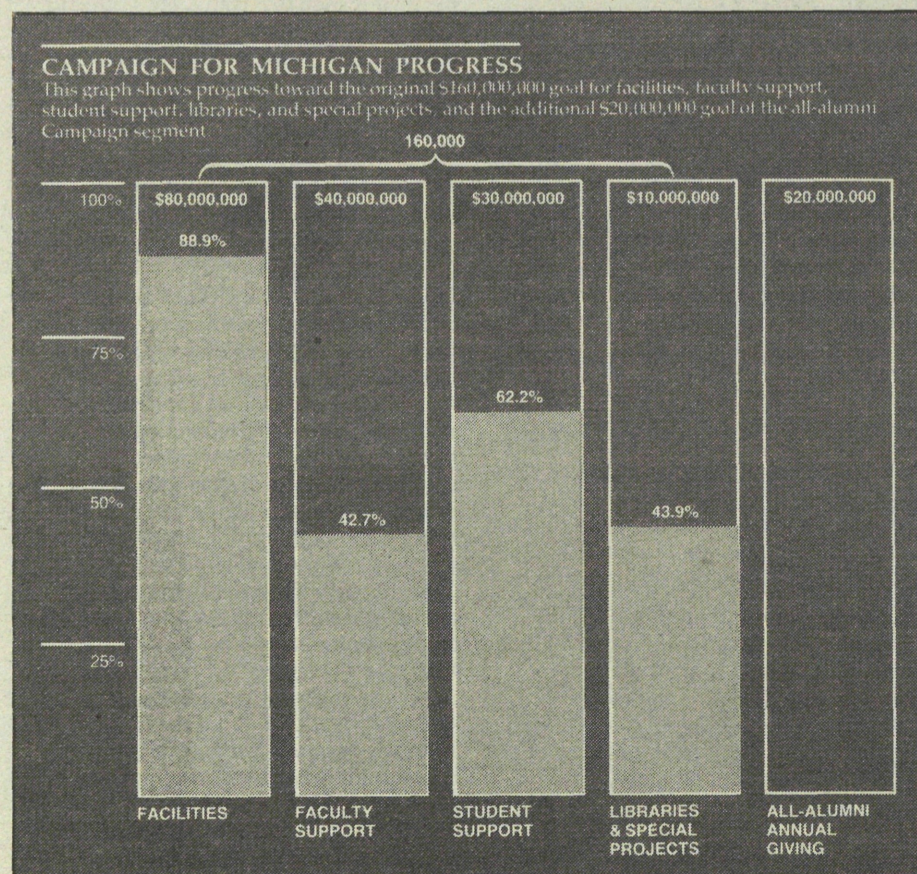
Under Edman's leadership, major gifts will be solicited, with special emphasis on large leadership gifts. As national major gifts chairman, he will work with Campaign Chairman Robert E. Nederlander and with other national volunteer leaders through the close of the Campaign in 1987.

Edman is currently area co-chairman of the Campaign in southeastern Michigan. He also serves as chairman of the development advisory board of the U-M School of Business Administration. He was the volunteer general chairman in the Business School's successful \$15 million Campaign fundraising effort for new facilities.

According to Business School Dean Gilbert R. Whitaker Jr., "Edman is the most committed volunteer I have ever met. He has been an inspiration to the faculty and administration of the Business School and will surely do a terrific job for the Campaign."

Edman received a B.B.A. in 1950 and an M.B.A. in 1951 from U-M. He is a life member of U-M's Alumni Association, a Presidents Club member and is recognized as a U-M Benefactor.

Edman joined General Motors in 1951. He held positions as comptroller and treasurer before leading the Finance Group. He is a member of the board of directors of the General Motors Acceptance Corp., president of the General Motors Foundation and a member of the Financial Executives Institute and National Association of Accountants. Edman and his wife, Betty ('52), who is past president of the Birmingham Alumnae Club, live in Bloomfield Hills, Michigan, and have six children.



LEARNING THE ROPES IN WASHINGTON

By Keri Bancroft

This summer, as in the 16 previous ones, some 100 U-M students in the Public Service Intern Program will be in Washington, D.C., not only to learn how the political process works but to take part in it.

The students will live in George Washington University dormitories while serving without pay in Congressional offices, executive bureaus and lobby organizations to prepare themselves for careers they'll pursue years later.

"Working last summer at the Brookings Institution [a think tank] and living in Washington, I gained the confidence to make it on my own in a big city and deal with new challenges," says David Gormley ('87), a political science major from Barberton, Ohio. "I feel much more confident about the future."

Heather Hehman ('87) of Cincinnati says her 1985 internship "opened up an entire world" for her. The American Culture major says the whole process, starting with the paring down of the 300 students who apply to 100, taught her the essence of competing in the job market of the real world.

According to Kerin McQuaid, experiential learning programs supervisor at the Career Planning and Placement Office, the summer program really begins the preceding fall when interested stu-



KERIN MCQUAID of the Career Planning and Placement Office discusses his Capitol Hill internship with junior David Gormley.

dents are interviewed by those who have previously held internships. The interviewers are not looking only for high academic achievers; they also want enthusiastic students firmly committed to career goals.

McQuaid says the students must be the "cream of the crop" because they will provide the only direct contact many officials in Washington will have with the University.

Both Gormley and Hehman said they were on a strict budget last summer and spent several thousand dollars supporting themselves in Washington. Financial aid is available for students who qualify, however. McQuaid says a third of the students receive some aid.

After the students are selected, they meet as a group to work on compiling resumes and personal statements for their applications. Although there are no guarantees, over the last few years all students who have applied through the University have received a position.

"I felt as if my offer from Brookings was a stroke of luck," Gormley says. "I was elated; I was finally going to Washington."

At Brookings, Gormley worked on a study of Federal Communication Commission licensing procedures, occasionally running down to the "Hill" to sit in on hearings. Gormley says his work was tedious, but it helped him understand that political science research can involve tiresome labor.

Hehman, who has her eyes on law school, sees her time at the Department of Justice's civil rights unit as a "vehicle for getting a good long-term job."

It was "amazing" to Hehman that she had full responsibility for checking out voting changes in counties across the country to make sure they didn't discriminate against blacks. While conducting a routine examination of a statewide election in Texas, she discovered that the state had not cleared the election through the department, as is required. Eventually, she says, the department sued Texas over this violation of the law.



Duderstadt

DUDERSTADT SUCCEEDS FRYE AS U-M V.P. AND PROVOST

James J. Duderstadt, dean of the U-M College of Engineering for the past five years, is the University's new vice president for academic affairs and provost.

Duderstadt succeeds Billy E. Frye, who was named dean of the graduate school and vice president for research at Emory University in Atlanta.

Duderstadt joined the U-M faculty as assistant professor of nuclear engineering in 1969 and was promoted to professor in 1976. He has served on the U-M Budget Priorities Committee, the faculty Senate Assembly and as chair of the University Advisory Committee on Academic Affairs.

He is a member of the executive board of the Center for Continuing Education of Women and has also served as chair of the divisional board and member of the executive committee of the Rackham School of Graduate Studies.

Among his many honors are the Chester Harding Plimpton Prize at Yale University, U-M Class of 1938E Award for outstanding teaching and counseling, and the Mark Mills and Arthur Compton Awards of the American Nuclear Society. He has also received numerous awards for teaching on the local and national level, including the College of Engineering Outstanding Teacher Award and the Outstanding Nuclear Engineering Educator of the American Society for Engineering Education.

Duderstadt was appointed to the National Science Board, the body charged with setting policy for the National Science Foundation, in 1985. He also serves on the Cornell University Advisory Council, the executive board of the National Engineering Deans Council and the State of Michigan Governor's Commission on China.



Photo by Scott Lituchy, Michigan Daily

ANTI-APARTHEID marchers from student, faculty, staff and community groups stride through Ann Arbor. The U-M has divested 99 percent of its holdings in companies with branches in South Africa. It has held some investments to test a state law that requires public institutions to divest their South Africa-linked holdings. The U-M contends that the law infringes on the constitutional autonomy of the U-M Regents. In a related matter, the University sanctioned a complementary spring commencement in the Diag organized by supporters of a nomination to award an honorary degree to Nelson Mandela, the imprisoned South African foe of apartheid. Held before the official May 3 commencement, the ceremony honoring Mandela was planned by the Free South Africa Coordinating Committee after the committee that nominates honorary degree recipients did not recommend Mandela's name to the Regents. The Regents have asked the University to study the criteria and rules for honorary degrees, including the Bylaw that requires recipients to be present at the award ceremony.

ADMISSIONS HOSTS PROSPECTIVE STUDENTS

The Undergraduate Admissions Office is hosting receptions for prospective U-M students in many parts of the country from August through October.

Locations and dates for the August meetings (all at 7:30 p.m.) are, in Michigan: Escanaba, Aug. 11, Terrace Motor Inn; Grand Rapids, Aug. 21, Airport Hilton; Hancock, Aug. 12, Eagles Lodge; Kalamazoo, Aug. 19, Hilton Inn; Lansing, Aug. 20, Lansing Harley Hotel; Marquette, Aug. 13, Holiday Inn, Marquette Mall; Petoskey, Aug. 14, Holiday Inn, US 131 South; Sag-

inaw, Aug. 20, Sheraton Fashion Square; St. Clair, Aug. 21, St. Clair Inn; Stevensville, Aug. 18, Win Schulers; Traverse City, Aug. 10, Holiday Inn on the Bay.

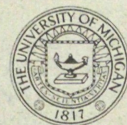
In other states: Buffalo, N.Y., Aug. 18, Buffalo Marriott Inn; Livingston, N.J., Aug. 21, Holiday Inn Livingston; Rochester, N.Y., Aug. 19, Marriott Inn Airport; Stamford, Conn., Aug. 20, Stamford Marriott Inn.

Later meetings will be listed in our August issue. For more information, contact Mike Donahue, Associate Director, Undergraduate Admissions Office, (313) 764-7433.

MANAGEMENT BRIEFING SEMINARS
JULY 31 - AUGUST 1 & AUGUST 4-8
TRAVERSE CITY, MICHIGAN

Brochures now available for The University of Michigan's Management Briefing Seminars in **Planned Innovation, Robotics and Automation, The U.S. and World Auto Industries, Quality Assurance, Occupational Health and Safety.**

For Information-Registration contact The University of Michigan, Conference Department, 200 Hill Street, Ann Arbor, MI 48104-3297. Telephone (313) 764-5305



WORKS BY U-M AUTHORS

Michigan Today will periodically update readers on some of the books written by U-M faculty members and graduates, and works published by the University of Michigan Press.

FAULKNER: Novels:
1930-1935

Edited by Joseph Blotner and Noel Polk

Although William Faulkner "has long since been canonized as perhaps the premier American writer," editions of his novels reflect the inaccessibility to previous editors of many documents that shed light on Faulkner's "final intentions" for each work.

Returning to Faulkner's manuscripts, typescripts, galleys and other material, editors Blotner, a U-M professor of English, and Polk, of the University of Southern Mississippi, have produced corrected texts of *As I Lay Dying*, *Sanctuary*, *Light in August* and *Pylon* that demonstrate a high degree of editorial integrity and evince a thorough comprehension of the deliberateness with which Faulkner composed these stories.

Readers who have appreciated Faulkner's rich and complex writing will learn much here about the rigorous control Faulkner exercised over every element of his art. (The Library of America 1985, \$27.50.) — **Mark LaRose.**

INVENTING ADOLESCENCE:
The Political Psychology of
Everyday Schooling
By Joseph Adelson

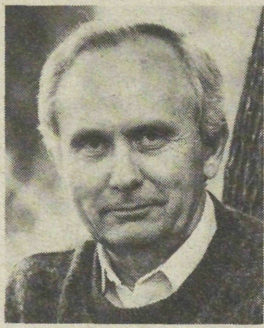
With this work (Transaction Books 1986) Adelson, a U-M professor of psychology, steps into the forefront of the ongoing re-evaluation of American public education. In his chapter "What Happened to the Schools?," the author makes the following comments about the political contradictions underlying the public school system:

"Far more than any other institution in U.S. society, the schools have become an arena for the struggle between the values of traditionalism and of modernity. Among the values of traditionalism are merit, accomplishment, competition, and success; self-restraint, self-discipline, and the postponement of gratification; the stability of the family; and a belief in certain moral universals. The modernist ethos scorns the pursuit of success; is egalitarian and redistributionist in emphasis; tolerates or encourages sensual gratification; values self-expression as against self-restraint; accepts alternative or deviant forms of the family, and emphasizes ethical relativism."

Although Adelson "would not want to say that the schools took the side of modernity," he does contend that those in control of the schools "tried to do both things at once, that is to retain the loyalty of the bourgeois family and yet offer the impression — to themselves and to others — of being 'with it,' contemporary, alert, and alive to the new values of the putative family."

Ultimately, the disease that has been spreading throughout the schools and undermining their authority, Adelson argues, is the schools' inability to resist the "false or meretricious or merely foolish ideas imposed on them by" the courts, bureaucracies and other "institutions that . . . know but a single thing, that thing being a distended and distorted idea of equality."

Adelson's views, unabashedly controversial and partisan, are expressed in a succinct, eloquent style. — **M.L.**



Walker

THE CHRONICLES OF
DOODAH

By George Lee Walker

Being a speech writer for top automobile industry executives sounds like an exciting job: You expect high pay, the creative challenge of helping to shape and present important ideas and the ego gratification of moving in powerful circles.

For U-M Hopwood Award winner Walker ('50), the experience appears to have been otherwise. His first novel, *The Chronicles of Doodah* (Houghton Mifflin 1985, \$7.95), a Book-of-the-Month Club alternate, is a satire depicting the dark side of the executive suite.

Walker knows his target well. After winning journalistic spurs as a reporter, he was a speech writer for Lee Iacocca at Ford Motor Co. and the board chairman at American Motors. He served former Michigan Sen. Robert Griffin, Michigan Govs. George Romney and William Milliken, and President Gerald R. Ford in the same capacity.

Walker's insider's view of top management has overtones of Kafka and Orwell. The narrator is bewildered by the impossibility of writing coherent speeches "by committee," threatened in obscure ways by superiors and never sure if he'll be promoted or fired.

One day he finds himself in the august presence of the Chairman, furiously taking notes for an important speech. Commanded on the spot to continue the assignment aboard a company jet en route to Los Angeles, the writer winds up abandoned on the airport tarmac, alone in a strange city for three days without instructions, without extra clothes, without even a toothbrush. He has only \$27 in his pocket and a yellow note pad filled with the Chairman's "thoughts."

The terrors that follow make this nightmare flight seem like a trip through Eden. A rigorous "executive training program," modeled after the martial approach of Japanese rivals in the automobile business, comes to illustrate the ultimate corruption of power. The whole corporate system, according to *Doodah's* narrator:

"... strongly favors the egoists and even the egomaniacs. The egomaniacs always believe they are right, and many times they are. Proven right in lesser decisions, they are elevated to positions where they must make big decisions. At the very top, they are free to make choices that cannot be questioned. Their belief in themselves, reinforced by cowed subordinates, huge salaries and obscenely rich surroundings, eventually becomes a belief in their own infallibility."

Loyalty to the company must be absolute, but the final test of the narrator probably will strike readers as both horrifying and inevitable.

Walker, who has nearly completed a second novel on corporate life, titled *Night of the Toy Soldiers*, says he worked on *Doodah* for about a year. "When you are writing a novel," he says, "it's like setting out on the Atlantic in a rowboat with a primitive compass. It's very lonely and isolated and spooky. You produce something and don't know whether it's a monster or a lovable creature." — **Gil Goodwin**

SLAVE EMANCIPATION IN
CUBA: The Transition to Free
Labor

By Rebecca J. Scott

Scott's study, released by Princeton University Press this year, is valued in part for her newly discovered primary sources in Cuba and Spain. The author, a U-M associate professor of history, focuses on the dynamics of the emancipation process and the consequent transition to free labor. She examines the forms and sources of pressure — social, economic, political and military — on the aging institution of slavery and, more importantly, analyzes the links between these factors and "the interaction among masters, slaves, rebels and administrators." — **M.L.**

SLAVERY AND FREEDOM
ON THE MIDDLE GROUND:
Maryland during the 19th
Century

By Barbara J. Fields

Fields, an associate professor of history at U-M, has re-examined every relevant strand in a tangled web of time, prejudice and political rhetoric, and gives the reader an illuminating account of Maryland as a border state in the Civil War: "A persistent quirk of American political writing — which equates 'center' with 'moderate' and attaches to both labels connotations of the reasonable, virtuous and pacific — has beguiled a good many people into accepting the border states at their own valuation. . . . Border-state politics have benefited from the same presumption of benignity that has given border-state slavery a better reputation than it deserves."

Fields analyzes the complex processes that resulted in the destruction of slavery in Maryland: "At its foundation, the collapse was a moral and political phenomenon, arriving from slaves' daily more vivid perception that their owners were no longer sovereign. Slaves and their owners together learned the relationship between power and authority. Having lost the first, owners could no longer claim the second." (Yale University Press 1985, \$27.50.) — **M.L.**

MQR DETROIT ISSUE
IN 2ND PRINTING

The *Michigan Quarterly Review's* special issue devoted to "Detroit: An American City," is the "fastest-selling issue in the 25-year history of the publication," according to editor Laurence Goldstein.

Now in its second printing since its appearance in March, the double issue sold 1,500 copies in four weeks. "We anticipated some increase in demand," Goldstein explains, "but weren't prepared for this. We normally print around 1,700 copies and ordered 3,000 for this issue, as we knew there would be more interest than usual."

Goldstein attributes some of the increase in sales to the publicity the issue has received from the press. "The interview which David Lewis conducted with Henry Ford II has received lots of attention," he reports. "Ford Motor Company of Sweden has even ordered 10 copies."

Copies of the MQR Detroit issue, which includes a mixture of essays, fiction, poetry and graphics, are available for \$8 from *Michigan Quarterly Review*, 3032 Rackham Building, Ann Arbor MI 48109.

This year marked the 55th in which the University has awarded Jule and Avery Hopwood Awards in Creative Writing. Poems by three of this year's winners appear on these pages. Readers will find other mention of the awards in the piece by Stella Osborn '22 on Page 4. A first novel by a 1950 winner, George Lee Walker, is reviewed elsewhere in this book section.

Spinach, I Love

Your stiff stem-snap
tastes of nosing deep in clover
and of March garden dirt,
chunks that clung to the hoe's chin,
the clank of it on the rocks within,
solid, raw.

I swallow you down to meet memory
of boxed leaves Mama thawed in the sink
and steamed —
a green-gone-wrong, we longed to spit
in our napkins.

I have since wondered who thought of it,
this cooking into slime,
why one would rather stew and wait
a time,
than eat a thing now.

Liza Field
Graduate Student, Creative Writing

Long Hard Bones

I
Eight months pregnant and baby-full
walking like running uphill.
I became wise in the strength of curves,
breasts riding up to my chin.
Twenty-six hours of pressing skull,
like the blade of a dull heavy knife.

II
Overflowing at howling hunger,
quick to unbutton my blouse.
Soft fuzzy skull, lips suckling air,
smell of his baby-dewed hair.
Lost in the moment of letting down,
the feast of my succulent skin.

III
This unspoken paradox puzzles me,
this buoyant full fleshy facade.
Long hard bones are what hold us together,
netted and tethered, threaded by tendons.
Mine are more like windchimes turning,
tentative, Mother of Pearl raking air.

Paula Gover
Graduate Student

Watching Elmer Go

His lungs gurgle like a tired drain.
Our eyes shift in groups;
his breath
rattles each door of the room

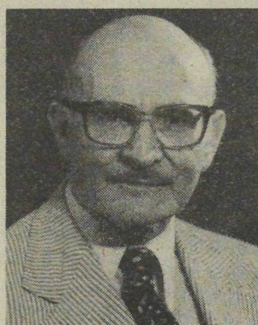
He's been dead for years
in his vibrating leather chair.
The demands: bacon, eggs, butter
potatoes, roast. Silence

It was said, he once drank
& even slugged grandma around.
Later, their bedrooms were on separate floors.
No one much talked.

When Elmer capsizes, his index finger
stiffens & shakes-out a warning,
or, maybe, he's ordering a sandwich,
then deciding, No . . .

Stephen Berry '87

A SUMMER SYLLABUS

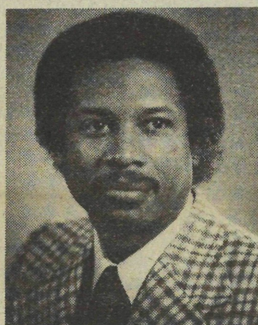


Alfred S. Sussman
Professor of Biological Sciences

Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction by Gillian Beer. The wide swath cut by Darwin is of interest to me both professionally and in terms of the origins of the metaphors we live by.

The Meaning of Creation: Genesis and Modern Science by Conrad Hyers. During a time when evolution is under assault it is important to return to the reasons for earlier controversies and to alternate meanings of the original text of the Bible.

Fires by Margaret Yourcenar and *Italian Folk Tales* by Italo Calvino. I read anything I can get hold of by these two authors.



George Jones
Interim Associate Dean
Rackham Graduate School,
Professor of Biological Sciences

My list includes *E. E. Just, Black Apollo of Science* by Kenneth Manning; *Dune*, by Frank Herbert; *Principles of Gene Manipulation*, R. W. Old and S. B. Primrose, and *Genetics and Molecular Biology*, by Robert Schleif. My list includes a mix of work-related and fun reading. My attempt to keep up with the current literature in my field leaves me less time for general reading than I would like.

Michigan Today

Michigan Today, published quarterly by News and Information Services, The University of Michigan, 412 Maynard Street, Ann Arbor, Michigan 48109-1399.

Jon Cosovich
Vice President for Development and Communication

Joseph H. Owsley
Director of News and Information Services

John Woodford
Executive Editor

Margot Campos
Design

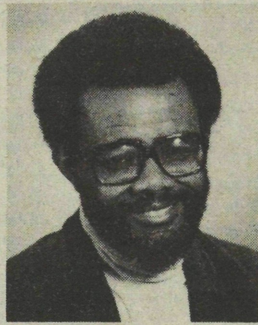
Diana Anderson, Keri Bancroft, Frank Blanchard, Kit Boss, Terry Gallagher, Gil Goodwin, Mark LaRose, Pat Roessle Materka, Stella Osborn
Writers

Bob Kalmbach
Photographer

Ruth Haessler
Telecommunications

NOTE: Statements in *Michigan Today* do not represent official policy of The University of Michigan

Summer reading lists are pleasant to draw up, and more so to complete. Readers may find it enjoyable to dip into the seasonable syllabus of a group of U-M book-lovers:



Lemuel A. Johnson
Professor of English

I have an "I'll be reading" and an "I will have to finish reading" list. In the second category (for research purposes and for a conference on Black Literatures of the World, to be held at the University of Queensland, Brisbane, Australia), the list is made up of:

Segou: les murailles de terre, a rather complex historical narrative, set in the 18th-century African Sahel, by the Guadeloupean novelist, Maryse Conde.

Chombo, an Afro-Panamanian novel by Carlos Guillermo Wilson.

The Black Presence in English Literature, a collection of essays by various hands, edited by David Dabydeen.

My category one list includes: *Monuments and Maidens*, Marina Warner's study of the female body in allegory.

A Social History of Black Slaves and Freedmen in Portugal 1441-1555, by C. de C. M. Saunders.



Marjorie Levy
Dean, School of Art

A History of Architecture Settings & Rituals by Spiro Kostof. A story of humans taking possession of the land and shaping communities through the act of building.

Biography of Jennifer Bartlett by John Coplens. One of the most important visual artists of the '80s, whose work enlarges our notions of time, of memory, of change and of painting itself.

Sam Maloof, Woodworker. This is the autobiography of a man with a profound artistic vision who has devoted his life and work to making furniture. At the age of 68, he was recently awarded a Macarthur Foundation grant of over \$300,000 for a lifetime of accomplishment, to encourage his continued development as an artist-craftsman.

And I'll read my own mind and complete a body of drawing studies in preparation for a series of works in clay. Studies to be modeled on computer. Construction patterns to be generated in three-dimension and layers.

The manual for Autocad by Autodesk — a computerized design software system.



William Albright
Professor of Music

George Garrett's new volume of short stories (I am collaborating with George on an opera libretto *The Magic City*).

Charles Dodge and Thomas S. Jerse: *Computer Music*. I had hoped this book by my friend Dodge would be out by the time I was to begin my work for computer synthesis commissioned by MIT and the Massachusetts Arts Council. Unfortunately, it appeared right after its completion. So now I'll find out what I needed to know!

Tracy Kidder: *House*. I'm considering building one in the near future.

Virginia Woolf: *A Room of One's Own*. Strongly recommended by a friend.

I also will finish a volume of short stories by Isaac Bashevis Singer and continue to enjoy the striking historic photos in *An American Album*. I also want to do reading by and on Samuel Beckett.



Niara Sudarkasa
Associate Vice President
for Academic Affairs,
Professor of Anthropology

The Sorcerer's Apprentice, a collection of short stories by Charles Johnson, and *Reckless Eyeballing*, a novel by Ishmael Reed. Some of today's most provocative fiction is being written by highly talented black writers. Reviews of these two new books appeared in *The New York Times* a week apart. I was intrigued by the similarity of the imagery evoked and provoked by both books. I am also interested in the feud between Reed and Alice Walker, which is apparently continued through one of the characters in his novel.

Slavery and Freedom on the Middle Ground by Barbara J. Fields, U-M associate professor of history. Easily one of the most brilliant of her generation of American historians, Fields's study of 19th century Maryland already has the earmarks of a classic.

Collaborators, a novel by Janet Kauffman. Someday I hope to write an ethno-fictional account of my relationship with my mother and her mother. The review of the new Kauffman novel portrayed it as a poetic and sensitive depiction of a mother/daughter relationship that illuminates the "texture of women's lives."

Whites, a collection of short stories set in Botswana, by Norman Rush. The entanglement of black and white is one of the ironies and tragedies of southern Africa. I want to see some of this through the eyes of this American writer, who is apparently quite a promising craftsman.



Copyright Hank De Leo 1986

Alice Fulton
Assistant Professor of English

I want to re-read two of my favorite books. *Through the Safety Net* by Charles Baxter is a brilliant book of short fiction. I read it the first time for pleasure, but I plan to read it again with a more analytical eye. I'd like to know how these stories are working: what exactly makes them so rich and satisfying. And since much of Baxter's work is set in Ann Arbor, the book affords a glimpse of the quirks and commonalities that surround us.

I also will re-read one of my very favorite books by a contemporary poet: *Visiting Rites*, by Phyllis Janowitz. I continue to be fascinated by Janowitz's ability to combine humor and pathos, and her need to find meaning in the junk of our culture. The personae of her poems play bingo and overeat; they live in Newark and shop at Sears. Yet, fortunately, such lives are more touching than tawdry in this poet's hands. She's an original. I re-read her books every two years or so, with increasing wonder at her intelligence and courage.

I also plan to read *The Collected Poems of Josephine Miles*, a major poet, though a neglected one. She has an extremely distinctive diction and a rare willingness to embrace all aspects of life.

I've been meaning to read May Swenson's *New and Selected Things Taking Place* for some time now.

Finally, I intend to read Emily Grosholz's first book, *The River Painter*. This poet has a lucid, lyrical voice, a pure, song-like quality. I think many aspire to this sort of effortless music, but few succeed as well as she. Some of her poems are metered. The rhythms are variable enough to forestall monotony and regular enough to instill grace. At times Grosholz's voice reminds me of another Emily — what better recommendation could there be?



Marilyn Shatz
Professor of Psychology

Jerome Bruner's *Actual Minds, Possible Worlds*. Bruner and I find ourselves on opposite ends of the same podium about once every two or three years, so I like to keep up with his thinking and writing.

The Social Brain by Michael Gazzaniga. Busman's holiday reading. Margaret Atwood, *The Handmaid's Tale*. My annual Feminist *it-can-always-be-worse-(better)* reading.

John LeCarre's *A Perfect Spy* and Anita Brookner's *Hotel du Lac*. These two are fun reading for foggy days on the Mendocino Coast in Northern California.

