

# Michigan Today

Tiny, smart probes may one day  
bomb cancer cells from within

## Fluorescent Voyage

(See story on page 2)

Illustration courtesy of Raoul Kopelman

Michigan Today  
The University of Michigan  
News & Information Services  
412 Maynard Street  
Ann Arbor, MI 48109-1399

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DETROIT, MI

Philbert (left) and Kopelman seem to be peering at their special PEBBLEs invention in fluorescent solution at Kopelman's laboratory in the Chemistry Building. They aren't really seeing the tiny bubbles, however, because 'they are too small to be seen even under the most powerful microscope in the world,' Kopelman says.



Photo by Martin Tloet, U-M Photo Services

**Tiny to a once-fantastic degree, smart probes developed by U-M duo may one day bomb cancer cells from within**

# Fluorescent Voyage

By John Woodford

In his 1966 novel *Fantastic Voyage*, biochemist-turned-writer Isaac Asimov tells the story of a team of voyagers who travel into deep inner rather than outer space in a trip through the human body. Their assignment: to reach a blood clot in the brain of a brilliant Soviet scientist who has defected to the West. After miniaturization to microscopic size, they stream in a shrunken submarine through various pathways of the human body and blast the clot with a laser.

As he did in other writings as well, Asimov imagined a technology that later became reality, in this instance nanotechnology, which involves devices that operate within the billionth-of-a-meter dimension.

One of U-M's leading nanoresearchers is Raoul Kopelman, who is pointing in his office in the Chemistry Building to an artist's adaptation of the *Fantastic Voyage* poster. It dramatizes the explorations that Kopelman and colleague Martin A. Philbert are charting through living cells. "We copied the idea of the illustration from the movie based on Isaac Asimov's story," says Kopelman, the Kasimir Fajans Colle-

giate Professor of Chemistry, Physics and Applied Physics. Like most outer space probes these days, however, only unmanned vehicles will make this voyage.

Asimov's microscopic travelers "dodged an immense system of antibodies that could have destroyed them," Kopelman says, "while at the same time they caused no damage to the body. That is biocompatibility. That is what we hope to achieve with our nanoprobes."

## Lights on in a cell

Kopelman and Philbert, associate professor of toxicology at the U-M School of Public Health, have co-invented two classes of nanoprobes, which they call nanosensors and nanoeffectors. The nanosensors are a refinement of Kopelman's pioneering work with fiberoptic sensors. In 1992, he began making what were at that time the world's smallest fiberoptic (or any other) sensors, small enough to be pushed into a cell, where the devices registered chemical activity. "We coated fluorescent sensing material

as a film on the tip of a fiber sensor and poked it into the cell," he says, "but that was both invasive to the cell and quite time-consuming. The other big question was how to deal with getting the light through the tip effectively."

In 1996, Kopelman and Philbert came up with the idea of using polymer chemistry to make a fiberless device. The result was tiny beads—they take up only about a millionth of the area of a cell—called PEBBLES, for Probe-Encapsulated By Biologically Localized Embedding.

To make the nanoprobess, researchers mix up a highly sophisticated "salad dressing," Kopelman says—that is, a mixture of minute polymers, which can be likened to fatty oil beads, in water. After very fine-tuned preparations, the structures self-assemble in a chemical reaction. As the beads form, they enclose the "dressing's" tailor-made ingredients: fluorescent sensor molecules, light-trapping agents, and antioxidants and other chemical components that optimize sensing and reduce damage to the cell.

#### Gene guns fire pebbles

Researchers insert the pebbles by using a gene gun—a sort of high-tech, helium-powered shotgun ordinarily used to shoot DNA into a cell. After firing pebbles into a cell culture to sharpen their marksmanship, they learned to vary the pressure so they could place the pebbles right into a specific area of the cell's cytoplasm. Once there, the pebbles do what they are designed to do: monitor responses to pathogens, toxins or carcinogens.

"The pebbles go into the cell without damaging it, which the fibers couldn't do," Kopelman says. "The particles of light, or photons, can get in and out of the beads by themselves to activate the fluorescent dye that responds to the targeted element—calcium, sodium, potassium, zinc and so forth. You shine a light in, usually blue, and you get a green light out as fluorescence. The intensity and color of the light show you what is there, and the color distribution tells you the chemical analysis in real time."

Since the pebbles are only 20 to 200 nanometers in diameter, only 10 times the width of a DNA helix—taking up only about a millionth of the volume of a cell—they are beneath the notice of the cell's immune system. They just hang along the wall, waiting to do their thing, and seem not to disrupt the cell's normal biochemistry.

#### 'Chemically biofriendly'

"That's the big advantage of the pebbles," Kopelman says, "they are chemically biofriendly. There is a two-edged effect: the bead protects the dye from the cell and the cell from the dye. Before, when the dye was not enclosed in pebbles, we had to trade off the specificity of binding the sensor against its toxicity. The more specific a dye, the more toxic it may be." Now, with the pebbles, researchers can gain more information by using levels of dyes that would be harmful to the cell if they weren't securely encased.

Another advantage is that several pebbles can be placed in a cell, permitting a broad range of simultaneous monitoring and measuring of a variety of cellular chemical activities. "This increases the range of things we can measure, such as the presence of a pathogen and its interaction with the cell, or the activity of a drug within the cell," Kopelman says. With optical microscopy, they can get readings within milliseconds.

Because of their various "smart-material" features, Kopelman says, pebbles may one day come in diverse forms, some that dissolve after a specified time and others that "go in, stay there for a set time and then leave the vasculatory system."

#### Killer Oxygen to fight cancer

Once they'd made the nanosensors, which they've patented through the University, Kopelman and Philbert went to the next step. "In addition to sensing, we wanted nanoprobess that could do work for us," as Kopelman puts it. The chief task they want the nanoprobess to do next is destroy cancer cells with Killer Oxygen.

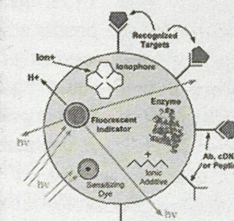
Molecular oxygen is normally stable and composed of two atoms joined by a strong bond, but when the appropriate wavelength of light is shined onto special pebbles placed strategically on or adjacent to a cell, the oxygen molecule is converted to the highly reactive singlet oxygen. Singlet oxygen is a species Kopelman calls Killer Oxygen.

We read a lot of news reports about the benefits of anti-oxidants these days. Why? Because, as Philbert explains, "3 percent of the oxygen that is normally in our bodies is killer oxygen. The oxidation process it sets off causes aging and disease processes. By harnessing and directing this chemical reaction, we have the potential for a direct, targeted treatment for cancer cells."

Continued on page 4

## Fluorescent Monitors

Living cells are constant sites of interactions with normal and abnormal, friendly and threatening, chemicals. Monitoring this activity in real time right at the microscopic spot can help researchers understand what happens in healthy and



Schematic of a PEBBLE sensor, containing various active ingredients within a biocompatible polymeric matrix and targeting recognition elements on the surface.

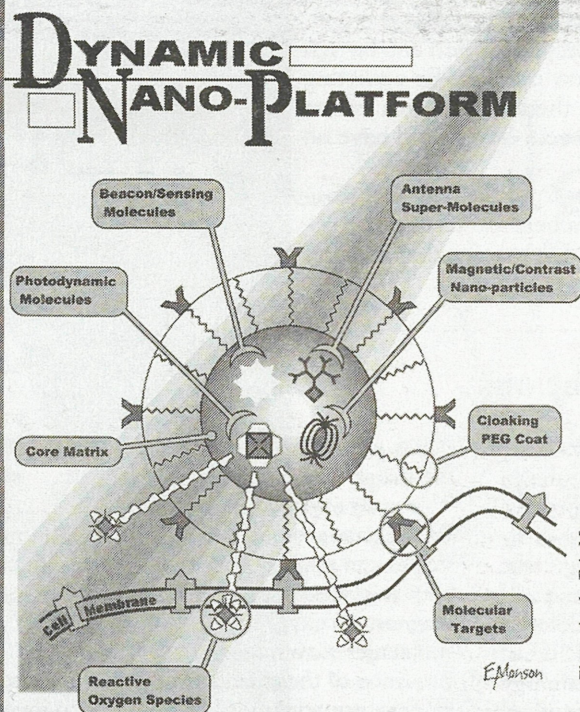
toxic states, what drugs do and how well they do it, and perhaps even rid cells of toxins or destroy unwanted cells, including cancers.

One way to monitor electrochemical activity within a cell is to trace the response of certain ions (electrically charged atoms), such as potassium, calcium or zinc, to external stimuli. Prof. Raul Kopelman and his research team of chemists, toxicologists and physicists have developed a way to measure these changes by encapsulating into PEBBLES molecules that attach specifically to one ion or another. These molecular sensors within the pebbles identify which chemicals are in the cell and monitor their activities and level of concentration by turning on the fluorescent dye.

Fluorescent molecules, called fluorophores, are excited by light of a particular wavelength. The fluorophores store the light energy shone in and emit it—or fluoresce—at a different wavelength. An example would be, if blue is shined in, green is emitted. The dye responds differently to each substance, forming a unique glow identifying the targeted substance and its level of concentration in the cell.

The challenge was to figure out how to build such a mini-sensing system and introduce it into a cell without harming the cell or setting off a cellular defense system that would destroy the probe.

Kopelman and colleague Martin A. Philbert figured out how to make the sensors five years ago. The nanosensors were the first class of nanoprobess they invented (the prefix "nano" describes sizes in the realm of a billionth of a meter). Nanosensors detect, measure and monitor specific biochemical ions and molecules. A second class of nanoprobess, called nanoeffectors, actuate processes to achieve desired ends, such as releasing deadly "bombs" within malignant tumor cells. The devices have been tested in living cells and are now being tested in a cancerous tumor in a laboratory rat.—JW.



This illustration shows Profs. Kopelman and Philbert's current and proposed extensions of their PEBBLE technology to what they call multipurpose 'Dynamic Nano-Platforms' The incorporation of magnetic and optical control and contrast elements enables a number of functions, from biological sensing to targeted photodynamic cancer therapy.

Illustration by Eric Monson

# Voyage

continued from page 3



Kopelman

**RAOUL KOPELMAN** was born in Vienna in 1933. His father was a prominent film producer. Among Kopelman's early memories is the delight his father, returning from 10 months in the Buchenwald prison camp, took in his 5-year-old son's suddenly discovered "whiz-kid" skills in math. Shortly

thereafter, the family of three escaped to Jerusalem with their lives on April 1, 1939.

A booklet on chemical experimentation excited young Raoul in the 6<sup>th</sup> grade, and he and four Tel Aviv classmates founded a chemistry club. They had a "wonderful time detonating explosives or subjecting bugs to carbon dioxide, pure oxygen or a vacuum. In contrast to the theory in the booklet, nothing would kill a Middle Eastern bug."

Kopelman was 16 when his father died, so while studying chemical engineering in college he taught Hebrew literature at a night high school. In addition to his studies, he held a day job at the Israel Mining Company.

After receiving his B.S. and M.S. from the Israel Institute of Technology, Kopelman moved to the United States in 1957 to earn his doctorate at Columbia University (1960). In 1966, he joined the U-M faculty. "I started my career in science and technology with the idea of applying my talents to the service of society and humanity through both research and teaching."

Kopelman wrote in the July 28, 1994, issue of the *Journal of Physical Chemistry*, which honored him for his career up to that point. He was just beginning the work on the optical-chemical probes featured in this article. "I feel that that I am doing right now the most exciting work of my life," he said then, adding that that is a feeling he has enjoyed throughout his career.



Philbert

**MARTIN PHILBERT** grew up in Heston, England, on the outskirts of London. His field is neurotoxicology with a specialty in experimental neuropathology. "Professor Cavanagh took me under his wing while I was a student at the Royal Postgraduate Medical School in London," he recalls.

"He showed me sections of diseased and poisoned brains down a microscope and I was hooked."

His avocations include presiding over the board of directors of the Ann Arbor Symphony and performing as an organist in the Plymouth area. He also enjoys playing sand volleyball.



Monson

**ILLUSTRATOR ERIC MONSON** PHD '99, applied physics, is a research fellow in the Kopelman Laboratory, specializing in microscopy and the development of new methods of measurement. His other responsibilities include administrative work. Scientific illustration is a sideline.

Philbert points out that when we use sunlight or ultraviolet light to "clean up," that is kill, unwanted bacteria, fungi or other undesirables, "we're using the effect of singlet oxygen. Bleaching is another form of this deadly oxidation process."

## Detonating a tumor

And that brings us to the second type of nanoprobe Kopelman and Philbert have invented—nanoeffectors. They are developing a way to use the two types of pebbles in tandem. Nanosensors would find cancer tumors with pinpoint accuracy, and nanoeffectors would then destroy the tumor cells by detonating killer oxygen. They are close to receiving a patent as coinventors of the nanoeffectors, too.

"We are decorating, you might say, the surface of loaded nanodevices, causing them to accumulate in the region on cancer cells," Kopelman says. Many investigators are experimenting with various methods of delivering drugs to cancer sites, Kopelman notes, "but the drug molecules reach the cell as individual molecules, and there the cancer cells soon gain an advantage over the drug by figuring out how to pump it out of the cell. They become immune to the drug. So if the cell you are attacking has developed resistance proteins that eject the attacking molecules, you're sunk. That's why cancer can survive chemotherapy."

Kopelman, Philbert and their team figure a better way may be to bleach cancer to death. "We hope killer oxygen can destroy the entire cancer cell at once," Kopelman says. "With chemotherapy, we have to weigh the toxic side effects versus the desired therapeutic effect. But theoretically, killer pebbles would be a completely inert and benign substance until you switched on the specific actuating wavelength. You would release the killer oxygen where and when you wanted it. The cancer cells would have no chance to fight back."

Backed by a \$3.5 million grant from the National Cancer Institute, Kopelman and Philbert are testing the potential therapy on a live animal. Ultimately, they need to

prove that the pebbles will not spark an immune reaction in human cells. Principal researchers joining them are the U-M Medical School's Brian Ross, associate professor of radiological sciences, and Alnawaz Rehemtulla, associate professor of radiation oncology.

The team is working on a brain cancer model. They have implanted a uniformly lethal cancer cell into the brain of a rat and are attacking the resulting tumor with pebbles.

"We introduced a special pebble with a contrast agent, the element gadolinium," Kopelman says. "We inject the pebbles into the bloodstream. Normally, the brain's blood barrier would bar anything from entry, but where the tumor is, the brain is leaky, so we recruit the blood vessels to get the pebble in. We did MRI [magnetic resonance imaging] studies to see what happened in our experiment. The pebbles selectively accumulated in the tumor within hours.

"Next, we are hoping to get the nanoeffectors selectively onto the cancer cells and shine a light into the tumor via an inserted, micrometer-sized fiberoptic probe through the skull. The light would turn the oxygen entering the pebbles into killer oxygen, destroying the cell. We're using 'cool' light of the visible spectrum, not the hot infrared or harmful ultraviolet light. After that, physics and biology do the work."

Although researchers foresee a range of medical and engineering uses for pebbles nanotechnology, cancer is the main target for now. Kopelman says that he, Philbert and their colleagues have "many elements in place that will make the next three years very exciting for earlier identification and more powerful treatment of cancer. The beauty of it is we are using physics and chemistry to deal with a biological problem. And nothing is depleted inside the nanoprobe."

Kopelman sounds as primed for battle as anyone in a sci-fi adventure. "The pebble is a photon torpedo, clean and potent," he says. "You might say we have a lot of gunpowder on hand and can deliver a big bang without losing any casualties to collateral damage." **MT**

## Ecological Applications

Right now, the U-M team is focusing on biological applications of pebbles nanotechnology, to study pathogens, toxicants and disease processes by placing the pebbles in living cells, where they will remain without killing the cell. "But," says toxicologist Martin A. Philbert of the U-M School of Public Health, "the technology would appear to lend itself to identifying and measuring ingredients and contaminants in water, food, air and other substances whose relative pu-

riety is vital to humans and other living things."

Virtually anything can be measured by the nanoprobe. The sensor molecules can monitor zinc, potassium, sodium chloride, nitric oxide, glucose, magnesium, oxygen or calcium. "The molecules now used to sense the presence of these elements or substances are sometimes very toxic," Philbert says. "You wouldn't dream of putting them in a cell. But we can now introduce these tiny things that sepa-

rate chemical from biological and biological from the chemical, so that neither interferes with the other.

"With this technology we can now measure with exquisite precision physiology in extremely tiny volumes of a cell, approximately  $10^{-15}$  liter [a quadrillionth of a liter, called a femtoliter]. Before, if you wanted to measure, say, calcium, you injected a dye that could measure only calcium. Our process allows us to 'multiplex' the test. We have measured as many as three chemicals at a time."—JW.

# Prologue

The Ides of March were nothing to beware this year, as the Royal Shakespeare Company (RSC) came to Ann Arbor, was seen by a multitude of audiences, and conquered the stage.

It all began in March 1998, when then-Regent Philip Power was at a luncheon with the British Ambassador to the United States and members of the RSC. "During the conversation, it became quite clear the RSC was searching for an American partner," Power recalls. He mentioned U-M's history in theatrical productions. Upon his return to Ann Arbor, he related the conversation to U-M President Lee C. Bollinger and Kenneth Fischer, head of the University Musical Society (UMS). "And, lo and behold, three years later we get the RSC opening a five-year partnership with the U of M, just as I had hoped," Power says.

Bollinger and Fischer worked out the details of the RSC's first partnership with an American public university. The \$2 million U-M would supply would help the RSC stage special productions in England and also bring the troupe to Michigan for a multidimensional residency of plays, workshops and community outreach. This year's residency was the first of several projects in the five-year collaboration between the U-M, the UMS and the RSC.

"Shakespeare's history plays are among his most intriguing and challenging works," UMS President Kenneth C. Fischer said. "What the RSC was looking for was a place where the plays could be presented as a cycle,



Power



Bollinger



Fischer

but also where their context and meaning could be fully explored. The RSC sees the U-M as the ideal place for all of these things to happen."

In its three-week March residency, the Stratford-upon-Avon-based company performed new productions of four of Shakespeare's history plays—*Henry VI, Parts 1, 2 and 3*, and *Richard III*—at the 1,400-seat Power Center for the Performing Arts. The performances sold out.

"I am delighted the University is working as a partner with the University Musical Society and the Royal Shakespeare Company to bring Shakespeare's history plays to Ann Arbor," Bollinger said. "The RSC's Michigan residency will long be remembered, for sterling performances by this renowned theatrical company, as well as for the related educational and cultural programs that promise to inspire students and all those who love the performing arts and Shakespeare."

More than 225 U-M students enrolled in the course "Staging History: Shakespeare on Legitimacy and Rebellion," coordinated by U-M English Prof. Ralph G. Williams, who worked closely with the RSC in the months leading up to the productions (see interview). The lectures were open to the public.

In addition, the RSC was involved in more than 75 educational events, ranging from guest lectures, interviews and exhibits to workshops on acting, text analysis, voice and movement, set design and lighting. Almost 40 of these events were free and open to the public.



Williams

## It was Stratford-upon-Huron in March

# Shakespeare Plays Michigan

Whether he is lecturing on the Bible, Shakespeare, Dante, Renaissance art, the nature of evil or sundry other topics, Prof. Ralph G. Williams '69 PhD is known for filling U-M auditoriums beyond capacity.

A spellbinding speaker, Williams is both passionate and deeply informed about the topics he addresses. And those topics are as wide as his scholarly interests—which entail his knowledge of the Greek, Latin, Italian, French, German, Spanish, Hebrew, and Aramaic languages and some others he's working on. His interests include the theory of literature, English and continental Renaissance Literature, Medieval and Renaissance art history, the Bible, Dante, rhetoric, Nietzsche, the pastoral and satire.

It was no surprise to those who have heard or seen Williams speak—a gangly Canadian who combines the oratorical firepower of an evangelist with the gestures of an Italian—to learn that Royal Shakespeare Company director Michael Boyd formed a partnership with Williams as he developed the history plays for productions in Stratford, London and Ann Arbor.

*Michigan Today's* John Woodford spoke with Professor Williams about the RSC's productions at Michigan. *Continued on page 6*



Richard III (portrayed by Aidan McArdle) torments Queen Margaret (Fiona Bell).

# Shakespeare *continued from page 5*



Jack Nightingale as rabble-rouser Jack Cade in *Henry VI, Part 2*.

**Michigan Today: Why is the Henry VI trilogy staged so rarely?**

**Ralph Williams:** One reason is that Shakespeare's reputation, in the form our knowledge has taken, has depended on the enormous prestige of the comedies, tragedies and romances—the later works with their complex, lush, various, lyrical styles. In the early history plays, the language and characters are deployed differently. They are full of action, spectacle and a more direct language, with characteristics of the medieval morality and mystery plays. As a result many critics and scholars have declared them to be a sort of apprentice work. True, they are the work of a young Shakespeare, but not a Shakespeare with lesser creativity or intelligence. They are all stunning on stage, not apprentice work at all.

**MT: How was the play received in Shakespeare's day?**

**RW:** *Henry VI* part one was the most popular play in England by far, and it made Shakespeare's reputation. The rich panorama of characters, some historical and some invented, the sets and scenery, the allegorical types—all of this has the effect of lifting the plays out of history and making them show something about all of us. Among the plays' major themes is the story of families caught up in a time of conflict. We

know how families were set against each other in our Civil War. We know the impact on German-Americans of going to war against continental Germans. The plays dramatize such circumstances. Again and again in these plays, one has a sudden shock of understanding how they connect with the experience of crises in our times in the last century. Shakespeare caught with sometimes poignant, sometimes trenchant, deftness how humans act in such circumstances.

**MT: You began sitting in on auditions for the cast last June. What were the try-outs like?**

**RW:** The most frequent response from actors and actresses was, "I studied literature

at university, I studied at a top school of drama, and I can't figure out why no one asked me to read these plays before." They said any actor would covet a role like that of Talbot in *Henry VI* part one or of Margaret of Anjou in all four plays.

Margaret goes from *1 Henry VI* all the way through part three and into *Richard III*, which completes the trilogy and turns it into a tetralogy. She is transmuted from a beautiful, vitally young woman to a cursing, bitter sibylline figure. If you just see *Richard III*, as is usually the case since it's a popular play, you don't know how Margaret got to that point, and she seems strange. But when you see her from her origin in France, before her marriage to Henry VI, she's not strange.

**MT: The most famous character appears in the first Henry VI, Joan of Arc, but Shakespeare hardly presents her as the saintly "Maid of Orleans" we're used to.**

**RW:** Joan of Arc is a disaster to the English—a witch, Amazon and whore who stirs up a rebellion among those French who were subjects of the English at the time. The English capture her and burn her at the stake. Right after this scene in the play, one of the English leaders, Suffolk, sees Margaret. He lusts for her, and they seem to have a romantic relationship, but he's married and decides to woo her for the king. When she's imported to England, the civil wars known as the War of the Roses break out. To convey the point that England has brought what they consider to be a contagion into their land, Michael casts the same actress who plays Joan as Margaret.

**MT: What are some of the greatest scenes to you, that our readers might turn to even if they have no chance to see the plays?**

**RW:** There's a little scene in *Richard III*, which completes the story of the Henry VI's, in Act 3, scene 6. The Scrivener, is on stage alone. He's identified only by his job, which is to copy texts. Richard has ordered him to draw up a document that will give Richard a legal basis to order the execution of Lord Hastings, one of the key supporters of Richard's bid to capture the crown. The scrivener has spent 11 straight hours preparing it, and he knows it's to provide cover for a political murder and that he is complicit in the murder. The speech is just 14 lines. After observing that no one could be ignorant enough not to see through Richard's rigged indictment, the scrivener says:

*Yet who's so blind, but says he sees it not?*

*Bad is the world; and all will come to nought,  
When such bad dealings must be seen in thought.*

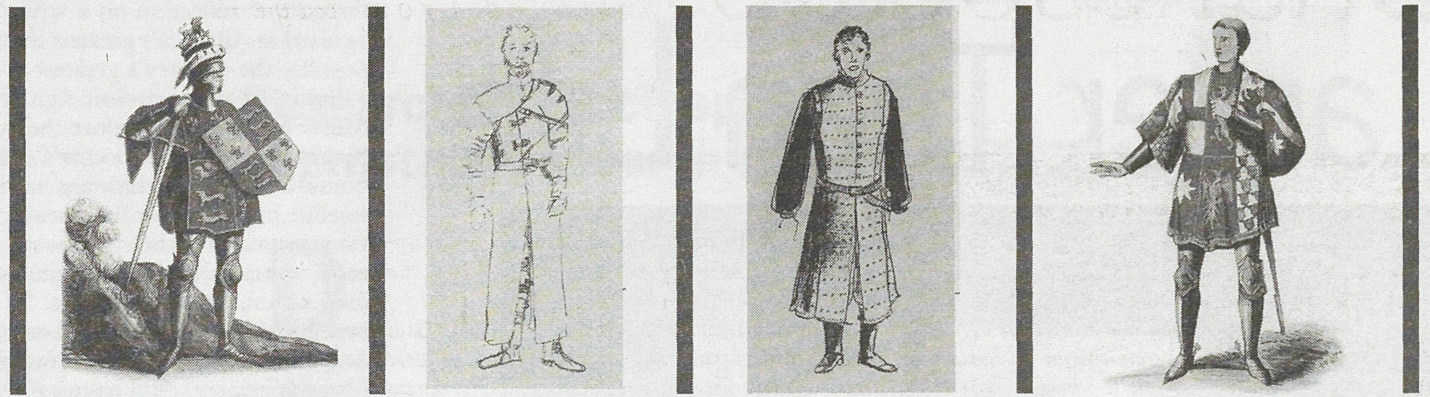
People see what is going on, but confine it to their minds and say nothing. And this is the most important theme of the plays: What does it take for evil to triumph, not just in medieval England but anywhere, anytime? It is the silence of the citizens who know differently, and especially *la trahison des clercs*, or treason of the learned, as the French say. The attitude that one should just do one's job and keep mum if one sees something wrong.

**MT: How did Shakespeare come to think so deeply about such matters at such a young age?**

**RW:** He was only about 30 when he wrote these plays, so I guess we can say only that the plays reflect the experience of a young man with a keen moral sensibility who has come to London from a village and learns there about the treasons and hypocrisies of the court. London was only about the size of Ann Arbor then, so Shakespeare could learn about the backbiting of leaders of his country at first hand. He is appalled and angered by what he sees.

**MT: What do you make of one of the great minor characters in 2 Henry VI, the anarchist and scamp Jack Cade, who leads a rebellious mob against the aristocracy?**

**RW:** Cade's observations about his country's woes start out as comic discourse, like a Lord of Misrule in medieval plays. After declaring himself king, Cade tells his followers: *...there shall be no money; all shall eat and drink on my score; and I will apparel them all in one*



Costuming studies for Richard III from 1830 alongside RSC designer Tom Piper's sketches for the U-M production.

livery, that they may agree like brothers and worship me their lord.

And his sidekick Dick replies with the famous line, *The first thing we do, let's kill all the lawyers.*

Cade accuses the aristocracy of making the illiterate vulnerable. But as we've seen with some rebels in our times, Cade's solution is not to educate the uneducated but to kill the educated. He says they have "corrupted the youth of the realm in erecting a grammar school." And his legal indictment goes on:

*It will be proved to thy face that thou hast men about thee that usually talk of a noun and a verb, and such abominable words as no Christian ear can endure to hear. Thou hast appointed justices of peace, to call poor men before them about matters they were not able to answer. Moreover, thou hast put them in prison; and because they could not read, thou hast hanged them; when, indeed, only for that cause they have been most worthy to live.*

Shakespeare's depiction of the rebels shows that he is incapable of leaving any major figure flat. Cade is like a character in farce, yet his is not a figure of farce. Instead, Shakespeare shows the dreadful parallel between the arbitrariness of mob action and the behavior of the ambitious nobility.

**MT:** These are "history plays," but how historical are they?

**RW:** The setting for the plays is the War of the Roses, the rivalry of the houses of York and Lancaster for the crown. Some characters are historical and some invented, and the same may be said of the plays' events.

A scene in the second act of *1 Henry VI* presents a sort of election in which the leaders of the feuding York and Lancaster camps tell the noblemen to choose sides: pluck either a white rose for the former side or a red for the latter. The side having more plucked is to be accepted as the royal line. This episode is not in the chronicles. But it shows that there can come a time when many warring factions, many diverse energies, are funneled into one of two directions. Allegiance is concentrated to an either/or choice for everyone concerned. Everyone is forced to choose, either you're with us or you're with them, our enemy. You are a Yankee or a Rebel, a Hutu or a Tutsi, a Kosovar or a Serb, and so on.

**MT:** The plays contain a lot of argument about the legal claims of the two tribe-like families contending for power. Do contemporary audiences have to understand these arguments to "get" the plays?

**RW:** There is a fiction by which they and we live, or try to live, our normal lives, and that is that the law is the discourse by which we mediate our differences and our terms of engagement. We want to trust that the law is objective rather than an instrument of political ill or faction—surely we can relate to that today.

The Lancasters and Yorks have placed their case before the highest court of law to say whose claim of inheritance to the

throne is stronger, the red or white. A lawyer looks at Somerset of the red camp and says, "Unless my study and my books be false, / The argument you held was wrong in you: / In sign whereof I pluck a white rose too." Richard Plantagenet of the whites, scoffs, "Now, Somerset, where is your argument?" And Somerset replies, "Here in my scabbard, meditating that / Shall dye your white rose in a bloody red." So much for elections. There is a recourse to violence when one's will is not done.

Shakespeare loves to play with the words "words" and "sword" as anagrams. Just take the 's' off the end of "words" and put it at the beginning: the turn from "words" to "sword" marks the decline into chaos. As Churchill said when he was asked why he spent so much time negotiating with the Soviet Union, "Jaw, jaw is better than war, war, war."

**MT:** Some point out that Shakespeare makes the warring camps, and especially Richard III, look far worse than they were, and that we should see the plays mainly as an example of Tudor propaganda. His sovereign, Queen Elizabeth I, was a Tudor. So was Shakespeare at heart a sycophant who wished to convince the public that the Tudors owed their success to the will of God?

**RW:** To me, this is a wrong reading. It ignores what's said in the plays and what happens. Some characters may say that the outcome reflects the will of God, but others talk of their desire for sensual gratification and power as the motive for their deeds. People give voice to both points of view and others in between. At the end of the four plays, Henry Richmond defeats Richard III at Bosworth Field and then proclaims as Henry VII that he and his queen are to be:

*The true succeeders of each royal house,  
By God's fair ordinance conjoin together!  
And let their heirs, God, if thy will be so,  
Enrich the time to come with smooth-faced peace,  
With smiling plenty and fair prosperous days!*

But Shakespeare knows as he wrote this a century or so later that the intervening years had not fulfilled Henry VII's hope. The religious feuds of Henry VII, the violent rivalry of supporters of Mary and Elizabeth, the contemporary domestic hostilities that threatened to collapse the reign of Queen Elizabeth—all that had and was occurring. So the audience of his time would take Richmond's speech as irony rather than accept it passively as comforting propaganda.

**MT:** Did Shakespeare think it dangerous to expose ruling-class factionalism and present anti-royalist scenes and ideas?

**RW:** Shakespeare had to be very careful in what he said through his characters about the qualities of rulers, their responsibilities and the correct popular or aristocratic attitudes toward the crown. *Richard II* was his most dangerous play in that vein. It shows the deposing of a monarch. We know it was performed about 40 times during the lead-up to Essex's rebellion against Elizabeth, sometimes in "open streets and houses," records say. Elizabeth, herself, once declared that she herself was Richard II. Some performances were yanked. In 1670, during another crisis over royal legitimacy, the authorities twice suppressed the play.

The *Henry VI/Richard III* tetralogy also shows the political effects of incredible pettiness in some powerful individuals, pettiness that can lead them to risk national calamity to satisfy their egos.

The pettiness and discord of the state are reflected in the dark recesses of Richard of Gloucester, whom we see scheming his way to the crown as Richard III throughout the four plays. Shakespeare shows the voluptuousness of evil through Richard. He's dining, or asking for strawberry desserts as he orders presumed enemies murdered or listens to detailed descriptions of their deaths. Shakespeare descends into the vortex of a criminal mentality and deftly and devastatingly links political lust and ruthlessness in such minds with the desire for food, sex and aesthetic gratification. **MT**

Arthur Miller is 'just a guy,' students find, yet—

# Larger Than Life

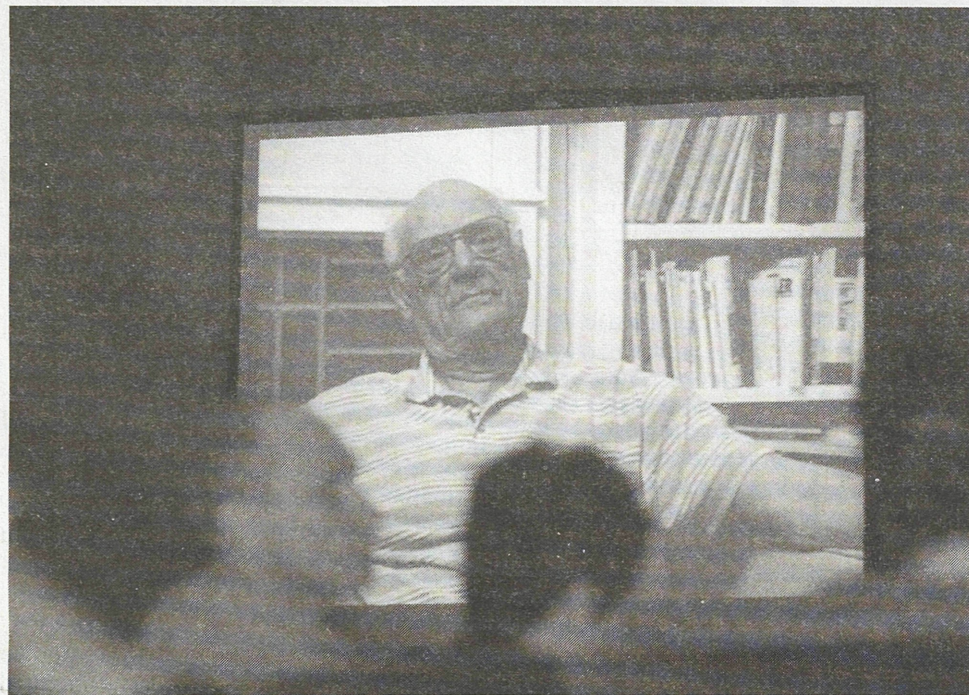


Photo by Paul Jaronaki, U-M Photo Services

Miller appeared on live satellite last semester after an injury prevented him from attending the symposium in his honor. The U-M's Arthur Miller Theater will be housed in the Walgreen Drama Center. A \$5 million gift from alumnus Charles Walgreen Jr. '28, '92 DHL, has provided major funding for the project.

By Leslie Stainton

Although the face, its chiseled features rising dramatically from a green sports shirt and gray pull-over, was familiar, the image was curiously Orwellian: Arthur Miller writ large on three screens above the stage at Rackham Auditorium, speaking by live satellite broadcast to a reverent crowd of about 700.

If he was uncomfortable with the set-up, Miller didn't show it, but instead gamely fielded questions for nearly an hour before signing off with an admonition to his listeners to cherish the theater, "the most democratic of all the arts."

His chief interlocutor, Prof. Enoch Brater, who interviewed Miller from the stage via a TV monitor, asked the playwright why he'd come to Michigan in 1934 as an undergraduate. Miller shrugged. "Because they took me in," he said.

For all his legendary status—and nowhere is he more of a legend than at the University of Michigan, which is now creating a theatre in

his name—Miller remains down-to-earth. At 85, he says he still goes to work every morning in the studio he built for himself on his Connecticut property. He's just completed a new play, his 24th. In his spare time he designs and constructs tables.

"He's just a guy," said U-M senior Quinn Strassel of Ypsilanti, Michigan, after hearing Miller speak by satellite at Rackham last October. "Yeah," agreed classmate Leslie Calhoun of Plymouth, Michigan. "He's like my grandfather."

Strassel and Calhoun were among the two dozen students who took a semester-long senior seminar on Miller taught last fall by Enoch Brater, professor of English and theater. The course covered Miller's plays and prose in chronological order, but the big draw was an international symposium at Michigan in late October marking the playwright's 85<sup>th</sup> birthday. Miller himself was scheduled to attend, giving students the chance not only to glimpse the famous author in person but, if lucky, to meet him during session breaks.

Organized by Brater and sponsored by the Office of the President and at least 14 addi-

tional University schools, departments and units, the event brought many of the world's most distinguished Miller authorities to Ann Arbor for three days' reflection on a writer generally recognized as America's greatest living playwright—possibly the country's greatest ever.

But in an all-too-prosaic sign of his humanity, Miller fell one week before the symposium and broke three ribs. On doctor's orders, he stayed home. University technicians hastily set up a live-satellite broadcast for the opening session of the symposium, and the show went on, albeit in a more virtual format than originally planned. Still, the excitement was palpable. "If I'd known there was going to be this much praise," Miller deadpanned from the screens in Rackham, after listening to President Lee Bollinger, Provost Nancy Cantor and LS&A Dean Shirley Neuman hail his achievement, "I'd have been more careful about falling down."

For Strassel, in particular, the three-day symposium had the feel of a spiritual rite, despite his disappointment at Miller's absence. The senior theater major not only attended nearly every session of the symposium, asking questions at each, but he played the lead in the theatre department's production of Miller's *A View from the Bridge*, which had its final performance during the symposium, before an invitation-only audience that included Bollinger and most of the conference participants.

He'd read *The Crucible* in high school, but it wasn't until last summer, after being cast as the self-destructive Eddie Carbone in *View*, that Strassel began to immerse himself in Miller's world. He read the playwright's autobiography, *Timebends*, and realized with a jolt, as countless other Michigan students have, that the "places I walk through every day"—the Diag, State Street—are the very places Miller once frequented. "It made him all of a sudden not this icon, but someone like me."

Through Brater's seminar, Strassel honed his understanding of Miller's dramaturgy—a process that enriched his portrayal of Eddie and deepened his appreciation for the moral courage Miller has displayed throughout his life, most famously during the McCarthy hearings, when Miller refused to "name names" and was subsequently convicted of contempt of Congress.

And while the students faulted some aspects of Miller, particularly his portrayal of women, which several viewed as outmoded, in plays like *Death of a Salesman* and *All My Sons*, they nonetheless gave proof to President Bollinger's contention during his opening remarks that "every student who comes here will have his or her imagination touched by Arthur's imagination. It's a form of identification and as such an important way of learning something about the world."

Inevitably, the intensity of the students' experience will fade. Strassel, who married a fellow theater major last summer, will move to New York to pursue an acting career. Calhoun intends to apply to law school. Others in the seminar plan to go into medicine and publishing. But they will leave Michigan knowing they experienced a special connection with a literary immortal, however briefly.

For all his apparent candor, Miller retains his mystique. Seminar student Stephanie Gray, a lanky blond from Toledo, paid oblique homage to the playwright last Halloween when she dressed up as his former wife Marilyn Monroe. During Brater's Q&A session at the symposium, Miller shied away from any discussion of his famous ex-wife, despite a pair of pointed questions about *The Misfits*, his 1961 screenplay starring the actress. Asked if the symposium had answered all her questions about Miller, Leslie Calhoun laughed and said no. "I mean, he didn't even talk about Marilyn!"

For classmate Quinn Strassel, such omissions didn't matter. During the final act of *A View from the Bridge*, Eddie Carbone gets into a fight with his wife's cousin, Marco. In the course of their struggle, Marco kills Eddie with Eddie's own knife. In his last performance as Eddie, on Friday night of the symposium, Strassel found himself thinking, "When I die, this play dies." Not wanting it all to end, Strassel held onto his knife, resisting Marco, longer than usual—and for a few seconds, the dream continued.

MT

Leslie Stainton is an editor at the U-M School of Public Health, author of *Lorca: A Dream of Life*, a biography of the Spanish writer Federico Garcia Lorca, (see Spring 1999 Michigan Today) and an Ann Arbor-based freelancer.



Photo by Smith Photography

Strassel as Eddie Carbone in *A View from the Bridge*.



## U-M joins Fathom, an online learning venture

The University has joined Fathom.com, an online learning and knowledge venture. The consortium of leading universities and cultural institutions will provide a range of free content, including lectures, seminars, videos and research. Fathom institutions also will provide e-commerce opportunities, including online courses, books and CD-ROMS.

Examples of U-M resources that Internet users likely will be able to access through Fathom include an archive of nearly three million pages of literary and historical encoded texts ranging from Blake to Shakespeare; a digital library dealing with American social history containing 5,000 volumes with imprints from 1850 to 1877; and more than 30,000 digital images, including great works of art, archaeological artifacts, handwritten diaries and rare photographs from the collections of great American museums and the U-M's own Museum of Art, Bentley Historical Library and Kelsey Museum of Archaeology. Also available will be online exhibits from the U-M Special Collections Library, such as "The Soviet Invasion of Czechoslovakia, August 1968," prepared in conjunction with a September visit by Czech President Václav Havel to the U-M campus.

In announcing the U-M's affiliation with Fathom, President Lee C. Bollinger said: "For some time now, I have felt that we should be prepared to participate in the emerging phenomenon of Internet education ventures. Of course, several of our schools and colleges are already doing this. We have not done so, however, as a University."

Other universities and cultural institutions in the Fathom consortium include Columbia University, London School of Economics and Political Science, Cambridge University Press, the British Library, the New York Public Library, the University of Chicago, American Film Institute, RAND, Woods Hole Oceanographic Institution, Victoria and Albert Museum, Science Museum (United Kingdom), and the Natural History Museum (United Kingdom).

"Fathom's primary goal is to open the enormous intellectual resources of these institutions to Internet users. Fathom's members will provide authenticated intellectual content for a rich, interactive Web site with multimedia information, including lectures, seminars, publications, databases, and performances," Bollinger said.

The content is organized in a unique thematic structure and driven by powerful software enabling Internet users to explore various areas of knowledge, he noted. The site can be previewed at <http://www.fathom.com>.

## Researchers block spread of prostate cancer in rats

By Sally Pobojewski  
U-M News and Information Services

Donna L. Livant, assistant professor of anatomy and cell biology, and her Medical School colleagues have developed a new cancer-inhibiting peptide (chain of amino acids) that has proven to be effective at preventing prostate cancer from spreading to other organs in laboratory rats.

Livant created the peptide by changing just one amino acid in a short sequence of a common blood protein called fibronectin, which circulates freely through the body in blood plasma, lymph, serum and interstitial fluid around cells.

When tissue is damaged, fibronectin at the injury site breaks into fragments that spread outward. Unlike intact fibronectin, which is present everywhere in the body, the fragments bind to fibronectin receptors on cells surrounding damaged tissue, which stimulates them to invade and repair the injury.

The downside to this process, says Livant, is that cancer cells can mutate so that intact fibronectin stimulates them to invade surrounding tissue also. "Cancer is the price we pay for our ability to heal from wounds," Livant says. "When intact fibronectin stimulates cancer cells to invade, they can easily reach the blood or lymphatic system and metastasize or spread to other parts of the body."

In early cell culture studies, Livant discovered that metastatic tumor cells are not invasive unless serum—the fluid component of blood that remains after clotting—is present. "No one realized serum was required, because no one had studied cancer cell invasion in the absence of serum before," Livant says.

After further studies showed that plasma fibronectin was the only part of serum required for invasion by tumor cells, Livant isolated a peptide in fibronectin, called PHSRN, that triggered the invasion process.

Using knowledge of the biochemistry of the fibronectin receptor site, Livant substituted the amino acid cysteine for arginine in the PHSRN sequence, speculating that cysteine might interact with the fibronectin receptor in such a way as to block binding and prevent the cancer cell invasion.

She tested her hunch by using the new peptide, which she calls PHSCN, on human and rat prostate cancer cell lines in lab cultures and found it to be a powerful inhibitor of cell invasion. She then tested it on laboratory rats injected with 100,000 cells from a naturally occurring metastatic rat prostate cancer cell line that can kill a rat in just 25 days.

After 16 days of tumor growth and five PHSCN injections, the mean diameter of tumors in treated rats was 1/2000 the size of tumors in untreated rats. Untreated tumors had more than 10 times the blood vessel density than did the tumors in the treated rats. This is significant, because tumors must have a blood supply to grow.

The research team documented its findings in the Jan. 15, 2000, issue of *Cancer Research*.

Livant's next goal is to discover exactly why the new peptide is so effective at preventing malignant cells from spreading and how it blocks the growth of blood vessels into the primary tumor.

The U-M holds several patents on the PHSCN peptide related to the diagnosis and treatment of cancer. The study was funded by the March of Dimes, the National Institutes of Health and the U-M Office of the Vice President for Research.

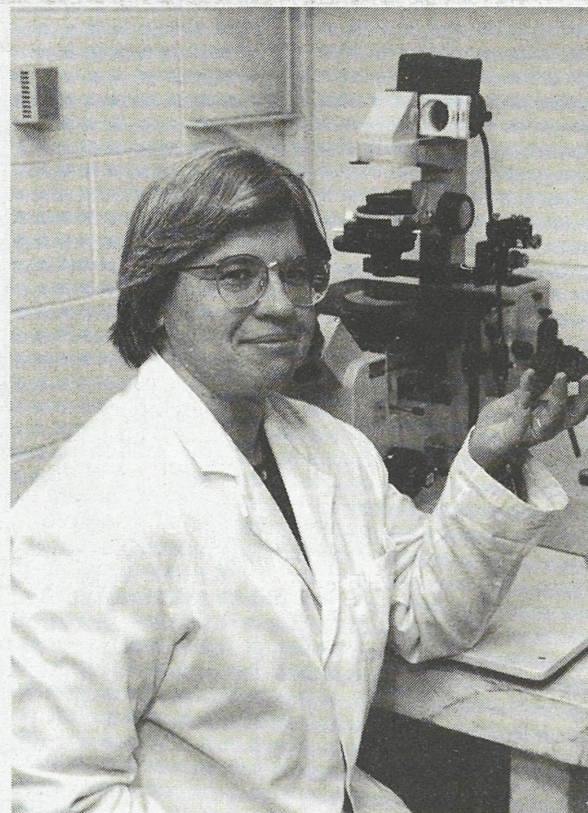


Photo by Paul Jaronksi, U-M Photo Services

Livant intended to use sea urchin membranes to grow cancer cell cultures but found the cancer cells wouldn't pass into the membranes because the sea urchin cells had no serum. This led her to discover a promising way to impede the migration of cancer cells in rats.

## US economy to rebound, U-M forecasters say

**W**hile the US economy's sluggish growth rate since last summer has sparked fears of a recession, U-M economists say that those worries are unfounded.

"The economy has slowed dramatically over the past year and is likely to register near-zero growth in the current quarter," says Saul H. Hymans, U-M professor of economics. "Rising interest rates, spiking energy prices and a retreating equity market have dimmed economic prospects and shaken consumer confidence, but a true recession is not expected."

Although the growth rate for real Gross Domestic Product (GDP) is forecast at just 0.8 percent for the first half of 2001, the economy should pick up steam in the second half of the year with a 2.9 percent rate of growth, Hymans and colleagues say. Overall, the economy should grow by 1.8 percent this year—down from last year's 3.4 percent mark—before expanding by 4 percent in 2002, according to the researchers.

In their annual forecast update of the national economy, Hymans and colleagues Joan P. Cray and Janet C. Wolfe say that greater economic growth next year will be enough to temper the current trend of rising unemployment. While they predict that the unemployment rate will rise from last year's average of 4 percent to 4.6 percent this year and to 4.8 percent in 2002, the jobless rate should drift downward below the current year's average by the end of next year.

As a result of declining energy prices, consumer price inflation is expected to drop from an overall mark of 3.4 percent in 2000 to 2.6 percent this year, before notching upward to 2.9 percent next year, according to the U-M economists.

"All of these developments, and their likely consequences in 2003, cause us to believe that the Federal Reserve will turn its sights back toward inflationary risks by the end of next year," Hymans says. "The Fed has moved aggressively to head off a recession, reducing interest rates 100

basis points since the start of the year, and we're expecting another 50-basis-point decline in this month [March].

"That move, we believe, will put the Fed back into a wait-and-see mode because the economy isn't nearly as weak as the news hype implies and because the Fed will want to set its longer-term policy to be consistent with the likely more expansionary track of fiscal policy in 2002 and beyond."

Hymans and colleagues say that President Bush's \$1.6 trillion tax cut proposal, which is now winding its way through Congress, would not significantly affect short-term economic prospects.

"It will have some small positive impact on economic growth late this year and next year," Hymans says. "And the passage of the tax cut could have a significant indirect effect by shoring up near-term consumer confidence. Indeed, the tax cut now appears to be so nearly a given that a political stalemate could well hurt consumer and business confidence sharply."

The U-M forecast (which is based on the Michigan Quarterly Econometric Model of the US Economy and compiled by the U-M Research Seminar in Quantitative Economics) also predicts that:

- Real disposable income will increase 3 percent this year and 3.6 percent next year.
- Annual sales of light vehicles will remain relatively strong at 16.7 million units in 2001 and 2002, after posting a record-setting mark of 17.2 million units last year.
- Private housing starts will drop from 1.61 million units in 2000 to 1.56 million this year, before rebounding to nearly 1.6 million in 2002.
- Oil prices, which peaked at about \$32 per barrel in the fourth quarter of last year, will decline to \$27 per barrel later this year and remain in the \$26-\$27 per barrel range throughout 2002.
- The federal budget surplus will rise from \$218 billion in fiscal 2000 to \$244 billion this year, before plummeting to \$187 billion in 2002—**BD**.

## Auto industry vital to state, Region, nation, study shows

By Bernie DeGroat  
U-M News & Information Services



Photo courtesy UAW's Solidarity Magazine

**T**he automotive industry directly employs more than 1.3 million Americans. But the jobs of more than 6.6 million U.S. workers—a total greater than the populations of 38 states—are linked in some way to the manufacturing and retailing of automobiles, according to a new U-M study.

Every job held by a worker at one of the 21 automobile manufacturers in the United States (621,300 jobs) and their dealerships across the country (717,400 new-vehicle-related jobs), "spins off" another four jobs either at automotive suppliers and industry-related companies or in industries such as services and retail trade where automotive employees spend their money.

These were among the findings of a national study by researchers who included George Fulton, Donald Grimes and Lucie Schmidt of the U-M Institute of Labor and Industrial Relations (ILIR); Sean McAlinden of the Environmental Research Institute of Michigan Center for Automotive Research; and Barbara Richardson of the Office for the Study of Automotive Transportation, a division of the U-M Transportation Research Institute.

Among individual states, auto-related employment ranges from a high of just over 1 million jobs in Michigan to a low of just under 8,000 in Wyoming.

Even excluding the considerable "induced" sources (that is, spending by people who receive income attributable to auto industry activity, e.g., realtors who sell homes to auto workers), the figures range from about 585,000 jobs in Michigan to 3,400 in Alaska.

The researchers also compiled automotive-related job data for the nine US Census regions and all 50 states and the District of Columbia. Including all direct, indirect and induced sources, the automotive industry job contributions range from nearly 2.4 million in the Great Lakes states (Illinois, Indiana, Michigan, Ohio and Wisconsin) to about 261,000 in New England.

"The concentration of auto-related

employment and compensation in the Great Lakes region is striking—36 percent of the jobs and 38 percent of the compensation nationwide reside in these five states," Fulton says. "But the industry also contributes significantly to some regions with little direct automotive manufacturing activity, due to spin-off activity generated by trade with other states that have a greater automotive presence."

Other findings from the U-M study include:

- The auto industry provides direct employment in every state, even when excluding dealership employment—from 15 workers in South Dakota to more than 260,000 in Michigan.
- Vehicle production in the United States increased 48 percent between 1991 and 1999, with a record-high 13 million units produced in 1999.
- Annual growth in constant dollar automotive output averaged 3.6 percent per year from 1987 to 1999, compared with 3.2 percent per year for Gross Domestic Product over this period.

Spin-off activities come from two sources: indirect effects, or purchases from domestic suppliers (e.g., steel); and the expenditure-induced effects described above.

According to the report, nearly 5.3 million Americans are employed by these "indirect" sources (nearly 2.2 million jobs at companies that supply parts, materials and services to the automobile industry) and "induced" sources (more than 3.1 million jobs at businesses where auto-related employees spend their money).

Overall, the jobs associated with total automotive industry activity (direct, indirect and induced) represent 5 percent of the private-sector jobs in the United States, accounting for \$243 billion in employee compensation (5.6 percent of compensation in the U.S. economy).

The study was prepared for the Alliance of Automobile Manufacturers and the Association of International Automobile Manufacturers.

## U-M Athletics announces football ticket price increase

### U-M third nationally

In 1999-2000 Michigan ranked third in the Sears Directors' Cup, a comprehensive measure of athletic success at all NCAA Division I universities across all men's and women's sports. Stanford and UCLA finished one-two.

**T**icket prices for Michigan football games will increase for the 2001 season as part of the athletic department's long-term plan for financial strength, Athletic Director Bill Martin announced March 15.

The changes, approved by the U-M Regents, include a tiered pricing structure based upon seat location within Michigan Stadium, Martin said.

In a letter to football season ticket holders and other supporters of U-M athletics, Martin said that the Department of Intercollegiate Athletics is at a "watershed time" as a result of developments such as the addition of 14 sports over the past 30 years, growing scholarship and travel costs, competitive pressures on coaching salaries, and the need for facilities and equipment maintenance and upgrades. Expenses have outpaced revenues in recent years, Martin said.



Martin

Martin noted that the ticket price increases alone would not solve the athletic department's fi-

nanial challenges but were part of a long-term strategic plan. In developing solutions Martin said were "unique to Michigan," the department conducted focus groups and fan surveys. It will continue its research as additional revenue streams are considered. These could include Stadium advertising, enclosed seating, and annual seat donations. A significant fundraising program also is planned.

In addition, Martin pledged to cut costs wherever possible and manage athletic department resources efficiently. He cited the elimination of four administrative staff positions and the University's work with the Big Ten Conference and the NCAA to find ways to reduce travel and publication costs and bowl game expenses.

Season ticket renewal applications will be mailed in April. More information can be found on the Web at <http://mgoblue.com/ticket/plan>. Other contacts: Dave Ablauf (734) 763-4423; U-M Ticket Office, Weidenbach Hall, 1000 S. State, Ann Arbor, MI 48109-2201.

### New ticket prices

The new ticket prices go into effect for football games in fall 2001. Michigan Stadium will be divided into four sections: Victors seats (between the 22-yard lines), Blue (goal line to 22-yard line), Maize (end zones) and Student seats. Season ticket holders will pay \$47, \$43 and \$39 for Victors, Blue and Maize seats, respectively, up from \$31 last year.

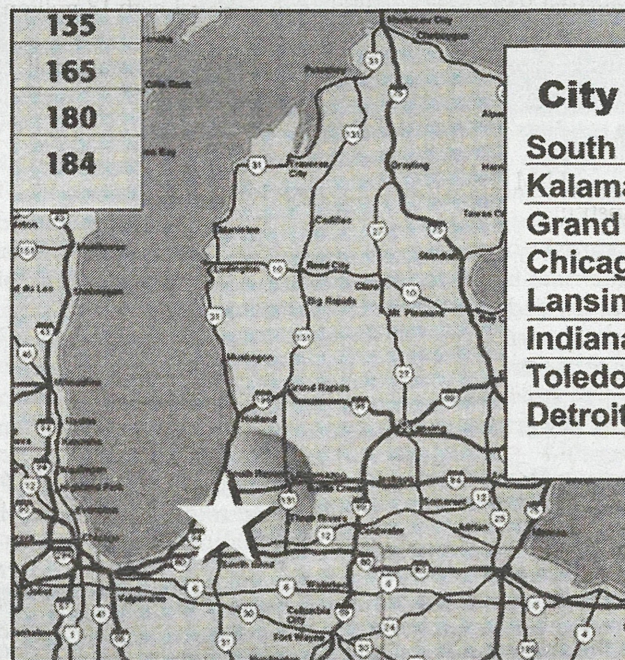
Student ticket prices will increase from \$13.50 to \$17.50 per game. Ticket prices for students have not been increased since the 1996 season. The student discount is 55 percent of the lowest season ticket price under the tiered seating plan.

Single tickets will be priced at \$51, \$47 and \$43. The Ohio State game on Nov. 24 has been designated as a premium game, with single ticket prices of \$56, \$52 and \$48. The premium game designation will not affect prices for season tickets.

Although windfalls over the years such as revenue from extra home games and short-term spikes in licensing royalties allowed the department to operate in the black, in the past three years it has had operating deficits, Martin said. "And just as disturbing," he noted, "we are facing a growing inability to invest in the future strength of the athletic program, including facilities, coaching and the academic support of our students."

The department's top priority, Martin emphasized, is the athletic development and academic support of its 731 student-athletes. The University aims to compete at the highest level in all 25 men's and women's sports, he added. All 25 teams are supported primarily by revenues from men's basketball, football and ice hockey. Other sources of revenue include Big Ten Conference distributions, corporate sponsorships, licensing royalties and private fundraising.

# into the business of life



| City             | Miles |
|------------------|-------|
| South Bend, IN   | 35    |
| Kalamazoo, MI    | 47    |
| Grand Rapids, MI | 80    |
| Chicago, IL      | 90    |
| Lansing, MI      | 135   |
| Indianapolis, IN | 165   |
| Toledo, OH       | 180   |
| Detroit, MI      | 184   |

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Pursuing the PhD can place doctoral candidates in some parlous states

# GRITTY GRADS

By John Woodford

## James Herron What do conversations in banks reveal about Colombians?

“...[S]urveys by some professional societies indicate that many PhD’s are having difficulty finding the jobs they want, particularly if they want tenure-track positions at research universities....Pursuing the PhD has always been a risky business.”—Jules B. LaPidus, Chronicle of Higher Education, Nov. 11, 1997.

The risky ventures experts commonly cite in graduate education are gaining admission to the program of choice, getting adequate financial support, completing doctoral requirements and obtaining the jobs successful candidates want after they receive the PhD.

But some doctoral students face other kinds of risks—those from their research environment. In most instances they can anticipate such risks, but in some cases they encounter challenges of natural or social origin unrelated to their topic of interest.

Michigan Today asked academic departments to help us contact PhD candidates who had faced various perils in the field. More than a dozen responded. Some didn’t wish to publicize their experiences because to do so at this time could compromise their research. Others agreed to share their stories with our readers.

“They generally attack at night,” James Herron says. The “they” being the Revolutionary Armed Forces of Colombia, or FARC, guerrillas of Colombia. And that’s what they did this time when they blew up the bank and Herron’s tape recorder with it.

Why was his tape recorder in the bank? That’s part of our story, which in some respects begins in the 17th century, when Colombia’s Spanish invaders established a reservation system similar to that of the United States to control the Amerindian peoples. One of those groups, the Guambiano (pronounced Gwam-BYAH-no), live near the town of Silva in southwestern Colombia, a region marked by regular fighting between FARC and the Colombian military and police. The conflict is now in its third decade and blazes on other fronts as well. A second large guerrilla group is waging a similar war, and other armed antagonists include peasants’ rights movements and right-wing death squads that kill peasants, journalists, politicians and guerrillas and appear to enjoy government support.

Herron was in Silva (pop. 10,000) for an eight-month stint to finish gathering data. He’d decided to work in Silva “because it had never been attacked by FARC, owing to an understanding between the Guambiano and the guerrillas.” Herron is a specialist in conversation analysis within the field of linguistic anthropology. His dissertation examines what attitudes the Guambiano and state officials reveal toward one another in their dialogues in Spanish. He tape-recorded 120 hours of conversations in the bank on the square opposite the room he occupied that night.

Urban Colombians warned Herron that it was “suicidal” to go to the region, that he could be kidnapped or killed, or both. “But that was city dwellers’ exaggeration. In the country, people were more realistic—and fatalistic—about my chances of getting in danger. The Guambiano have a tacit agreement with the guerrillas not to interfere with one another.” But the Guambiano live in the nearby mountains; Silva is predominantly Spanish, or “white,” in Colombian terms—and fair game.



James Herron (far right) and some residents of Silva, Columbia.

Photo courtesy of James Herron

“I was in my room,” Herron continues, “when the power went out at about 11. Power failures are common there, but I’d heard that the guerrillas always cut the power lines before attacking, so that possibility occurred to me. Then, all of a sudden, a great deal of automatic gunfire started cracking. The guerrillas fire in the air when they attack to warn people off the streets. I immediately hid under my bed. Next came larger explosions and more gunfire. A guy I knew knew someone in the guerrillas, and I asked him to get the word out that I was not worth kidnapping, because they were sure to have identified all strangers living in town. FARC occasionally kidnaps North Americans in the northern part of Colombia where the multinational corporations are. They grab engineers and execs for ransom. So on the night of the attack, I got almost hysterical.”

While Herron was hiding, some of his housemates crawled across the courtyard to check on his safety, even though guerrillas were posted as guards on the roofs of several buildings. “My friends found me and we went on hands and knees into a broom closet in the back of the house,” Herron says. “It was like a war scene. Then there was a really big explosion. When it got quiet, we came out. It was around 3 a.m., and an army reconnaissance plane was shooting flares around the area to see if they could spot the guerrillas. Sometime later, troops entered the town. When the shooting stopped, I thought the next order of business might be: Pick up the gringo. I guess they must have known I wasn’t worth it.”

Herron later learned that the 13-member police force had barricaded itself in their garrison while trying to hold off about 70 guerrillas. The firing stopped when the police threw in the towel and retreated to a bunker. The big explosion he’d heard was the blowing up of the bank vault. “They took the money and also pulled the hard drives out of the bank’s computers before leaving. One person died in the fighting. Some Guambiano kids were visiting a

friend’s house. They hadn’t heard the initial warning shots, so when the fighting began, they came out to the square and ran but one was shot and killed.”

Guerrillas attacked the bank—the Agrarian Bank—not only for the money, Herron says, but also because it’s the most prevalent national institution throughout the country. “Even a Colombian town that has no police station will have a branch of the Agrarian Bank. So the bank is always taken out for symbolic reasons as much as anything else. The local people always talk with pleasure about the bank’s loss of the hard drives containing their computer records, even though they know the bank has back-up records elsewhere.”

Fortunately, Herron had the interview tapes containing 70 percent of his recorded conversations with him. He is analyzing the conversations to show the underlying attitudes and assumptions latent in everyday discourse.

“The Guambiano speak quite fluent Spanish, but sometimes use certain mannerisms and grammatical structures from their language,” says Herron, who is fluent in Spanish and knows some basic Guambiano. “Sometimes pauses are appropriate in certain conversations, for example a pause of a certain length precedes answering certain questions, even when the answer is positive. Transcribing and analyzing conversations are highly precise tasks. I have to measure all of the pauses down to about one-fourth of a second and also note the stut-



Photo by James Herron

tering, the ‘umms’ and ‘ahhs’ and other disfluencies of speech. I will then show that the disfluencies happen when certain topics come up.”

The way the Guambiano speak has important consequences. For example, Spanish speakers, like English speakers, anticipate a negative answer from a person who pauses a while before responding to a sensitive question. Herron found that a bank official interviewing Guambiano loan-seekers often assumed the Guambiano were not answering forthrightly, were “shifty and uncreditworthy” because of the considerable pauses before their responses. But to the Guambiano the pauses indicate that “the respondent is giving the question due reflection,” Herron says.

Despite how many loan officers see them, the 12,000 Guambiano in fact tend to be good credit risks, “well-off for poor peasants and from a people who have preserved a robust culture despite their small numbers,” Herron reports. “I could look at the credit histories and other information and see that nothing else but the Guambiano’s speech habits could have led to denial of a loan.”

The Guambiano want nothing to do with the state or guerrilla forces, Herron says, although some grow poppies for the drug cartel, another armed and active element in Colombian affairs. “It’s common to see expensive SUVs carrying heavily armed men roll into town to handle drug trade business,” says Herron, who considered such figures yet another “nuisance” he had to deal with.

Speaking of nuisances, after guerrillas demolished the bank in Silva, he selected a bank in another town as a new field site. “That bank got blown up, too.”

MT

## James Buck What are bugs and fires doing to Siberia’s forests?

High on the list of potential dangers were Siberia’s bears, moose and ticks. But James Buck was used to them from his forestry work in North America. He was used to flies and mosquitoes, too, for that matter. But not like these—whose sound alone might drive a body mad.

“A constant hum of insects is always there, day and night, like an incessant engine,” says Buck, recalling his most recent stint in tent-living last year in the forests of central Siberia’s Krasnoyarsk region. “And day or night, on the other side of your tent flap, you’ll see hundreds and hundreds of flies or mosquitoes clustered, waiting for you to come out. I’ve spent time in northern Canada and worked for the US Forest Service in Alaska. So I know mosquitoes and flies. The ones in Siberia are beyond comparison. The quantity! The persistence! And they seem to be larger, too.”

Buck is working on his doctorate in the School of Natural Resources and the Environment. His field is forest dynamics, particularly the effect of multiple disturbances on forests in a Siberian region that is as tall as the United States is wide. Forest disturbances include logging and other human activities, animals nibbling and gnawing, fire, insects, wind and ice. But the disturbances occupying most of his research are those wrought by the Siberian pine moth, the bark beetles and forest fires.

The Siberian pine moth is misnamed somewhat, Buck says, because the insect’s favorite food, and the tree it most imperils, is the Siberian fir. But it doesn’t turn up its proboscis at pine or spruce, either.

“In 1995-96 the moth defoliated 3.6 million acres of forest,” Buck says. “Every seven to 11 years, the regional forests suffer an outbreak of pine moth and massive defoliation.”

Buck, two U-M undergraduates and Russian researchers bivouacked in a forest that the moth devastated in 1956. Patchy fires struck the area in 1960, followed in 1975 by a huge blaze. Another section of forest they camped in had suffered a big fire in 1980 and an infestation of bark beetles afterward. The team compared these woods with “control plots—old-growth, 500 to 600 years old, very beautiful, untouched forest that is too difficult to reach to attract commercial interests. We could drink from the streams in the Sayan Mountains,” Buck says. *Continued on page 14*



James Buck totes water in Siberia.

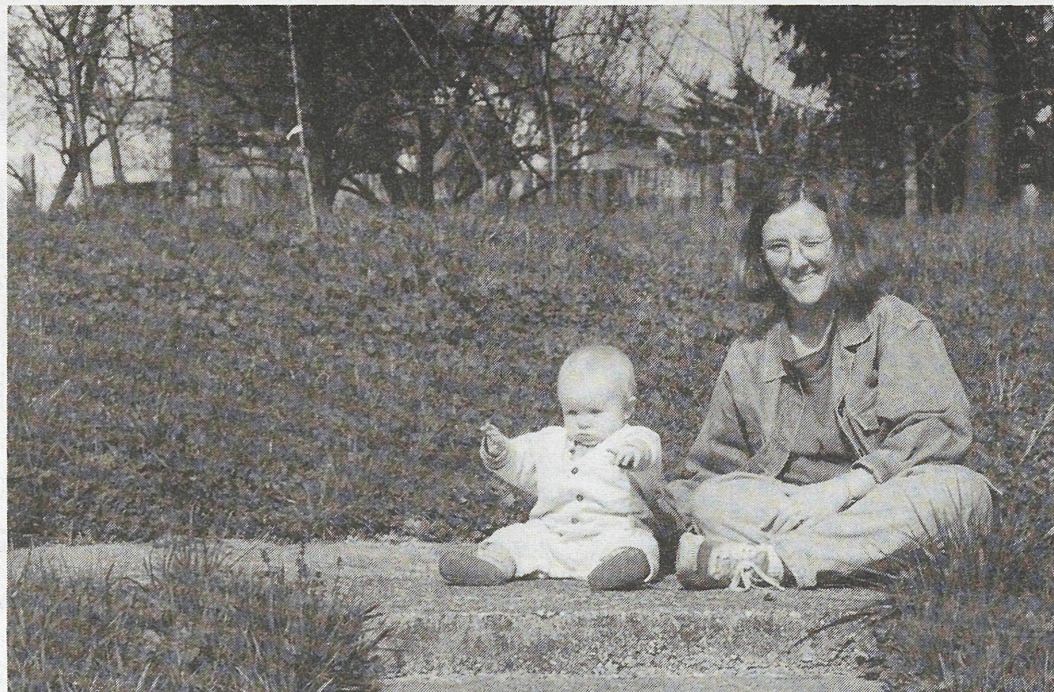
Photo courtesy of James Buck

## Meghan Hays How did Croatian women link nationalism to educational opportunity?

**M**ay Day is a great holiday for most of the world's workers, but it's also a cry of distress. Meghan Hays experienced both meanings in May 1995 while doing research in an archive in the Croatian capital of Zagreb.

May 1 was "a gloriously sunny day that drew everyone out into their gardens," Hays recalls. On that holiday, however, the Croatian military launched a brief surprise attack to recover Western Slavonia from Bosnian Serb occupiers.

The next day, as Hays sat reading in an archive, Zagreb suddenly shook with explosions. "At first nobody knew what had happened," says Hays, who was halfway through her scheduled six-month Fulbright fellowship at the time. She is completing a PhD in history and pursuing a master's degree at the School of Information, specializing in



Meghan Hays and Hazel shortly before the bombing of Zagreb.

Archives, Library Services, and Information Technology. Her topic is the reform and development of women's education in Croatia from 1869-1914, when Croatia was in the Hungarian area of the Austro-Hungarian state. Her husband and 10-month-old daughter had gone overseas with her.

In her research Hays follows three representatives of successive generations of women. "In the first generation," Hays says, "no schools of higher education in Croatia admitted women and few received even a primary education." The figure she focuses on was among the founders of the Union of Croatian Teachers.

In the next generation, Marija Jambrisak, Hays's primary figure, joined the union and organized the first lyceum for women. She succeeded, Hays says, by linking Croatian

Photo courtesy of Meghan Hays

## James Buck Siberia's forests, continued from page 13

Other areas of Siberia are not so lucky, he notes. "Lots of international companies are setting up mills, working with forest directors who are now forming private fiefdoms and profiting from uncontrolled logging in south-central Siberia."

Buck's Russian colleagues were from the Sukachev Institute of Forests, one of the world's foremost institutions in the field. Sukachev researchers have found that the Siberian pine moth prefers trees that are 80 years old or more. They forecast that after the recent devastation, the moth might not wreak damage again on this scale for decades, while the younger trees mature.

But Buck suspects that the moth threat may not subside. He says the moth "could adapt to the more

northerly region" and thus expand its range by developing a stronger taste for other valuable trees.

The second insect "disturbance"—the bark beetle—comes in three families. "They like various tree hosts ranging from recently dead, barely alive or very dead hosts," Buck says. One of them, a three-inch variety, leaves a hole so big that he mistook it for a woodpecker hole until a Russian expert set him straight. The beetles, which like to dine on a "stressed host," follow after the pine moth and attack the weakened, defoliated trees. They are also beginning to move from those hosts to nearby nondefoliated areas, where they cause even more damage. Scientists like Buck are trying to determine the impact of the damage on other wildlife and flora and on commerce.

When Buck arrived at the research team's first base camp this year, "I stepped out of the truck and put my foot right into the track of a big grizzly bear." Having encountered many bears and moose while researching in Alaska ("every other day I had a bear experience there"), Buck was more wary and took more precautions with storing food than the Russians did. Nevertheless, no one saw a moose or grizzly on this trip, he says, "but we saw plenty of signs that they were around. There are no known attacks by grizzlies on groups of four or more, and we kept in sizable groups. I wasn't displeased at not seeing a bear."

Buck made his first trip to Russia in 1992, speaking not a word of the language and intending to visit for a few weeks. He wound up spending a year there. "The culture intrigued me," he recalls. "As a Cold War baby, I never dreamed I'd be going to Russia and become so attached to it." His main attachment was to a Russian engineer in St. Petersburg. They married in 1994.

In addition to a master's degree in Russian studies from U-M, Buck has an MS in Natural Resources and Environment and studied remote sensing under the pioneer in the field, Charles E. (Chuck) Olson, Jr. (See *Michigan Today*, Oct. 1989, "Remote Sensing" by Eve Silberman). He applies that imaging technique to identify defoliated areas from space satellites.

But identifying defoliated areas after the fact doesn't help much in forecasting outbreaks, he points out. "We need earlier detection of the problem to be effective. In the United States we hear about the ecological catastrophes Russia is having, but we don't see the pristine, undisturbed areas like those north of Krasnoyarsk."

On his 1999 field trip he met fascinating dwellers in those forests, Old Believers, members of a religious sect that rejected and revolted against certain reforms in the rituals of the Russian Orthodox Church in 1652. The authorities attacked the Old Believers, oppressed them and in the mid-1700s, began exiling them to the Siberian woods. As years went by, some groups willingly took refuge there.

"I met a group living along the Berysa River," Buck recalls. "They've

aspirations for national progress to the improvement of women's education. The third woman whose career Hays has traced taught at the lyceum, enrolled at the university and agitated for day care and other increasingly politically charged issues.

When the brief explosions stopped, Hays left the archive and walked downtown, "hearing people speculating on the noises as I walked by. A thick column of black smoke trailed up from burning cars—but we didn't know they were cars. At the time we wondered, had it been a train wreck? I went to the Croatian School Museum. There, they thought it had been a car bomb. Only with the noon news on the radio did most of the city learn that it had been a rocket attack."

Hays had reimmersed herself in her research when two hours later her husband suddenly appeared at the archive with their daughter, Hazel. "He told me Americans were being evacuated. It had not occurred to us that this would happen. Someone from the US Embassy called him at our apartment, asking if we were ready to board the evacuation bus. My husband stalled her, explaining he needed to go downtown to try to find me. In shock, I tearfully bid the librarian good-bye."

The Embassy advised them to leave at once because they had an infant child, but they decided not to board

the bus. "We felt they were being a bit hysterical," Hays says. "Also, we needed time to pack and say good-bye to our friends. We decided we would wait to see what would happen."

They learned from news reports that a cluster bomb bearing numerous grenades had exploded in front of the main police station, injuring several people, some fatally. "Another pierced the roof of a streetcar as it passed close to the Cathedral," Hays says. "A woman inside was killed instantly. She was a refugee from Bosnia who perhaps had believed herself safe at last. A man getting out of his car nearby also died. Five people died from this attack, and several dozen were injured."

On the next day, May 3, "we went downtown in the morning to close our bank account," Hays continues. "I needed to pick up photocopies of research documents, so we went first to the School Museum, then started walking toward the university library, just after noon. People were strolling about us in the warm sunshine, Hazel was babbling in her stroller.

"And then, right over our heads, a huge explosion. Then another and another. The sound blasted on top of us and reverberated against the buildings on all sides. People scattered. We started to run toward the library, the nearest building. To do so we had to run across a wide-open plaza. I felt like a bug exposed to unseen attackers' eyes. I was pushing the stroller as I ran, while my husband was yelling to leave the stroller—but Hazel was strapped in, and I did not think we had time to stop.

Hazel was screaming, scared out of her wits. We all were. We reached the door of the library—by this time the plaza was deserted, and the heavy doors were closed. We pounded on them, and for a brief moment I felt like Dorothy with the tornado bearing down as she cried to her family to open the root cellar door. But the door opened for us, and several hands reached out and dragged us, stroller and all, inside."

They stayed in the cellar for three hours with a few hundred students, then left even before the all-clear signal had sounded indicating the police had located and deactivated all the unexploded grenades. After contacting the Embassy and learning when the last evacuation bus was leaving, they decided that they couldn't meet the bus in time and caught a taxi to their apartment.

"After this experience, we could not really consider staying in Zagreb," Hays says, even though she and her Croatian friends were convinced the "tit for tat" attacks were over. Their landlords offered them a house on the Croatian coast, and they accepted. "However, by then the Fulbright people in New York had learned that we were still in Zagreb. They said they'd suspended the program and ordered us to evacuate. Staying at the coast would not be good enough, they insisted. We had to leave the country, preferably to Ljubljana in Slovenia, where the other Americans had been taken."

But how to get to Ljubljana? The airport was closed, leaving a train or car as options. They feared being near the train station, and a rental car was too costly. "One of the landlady's daughters picked up a phone and called a friend," Hays recalls. "'Be here tomorrow morning with your car,' she told him. 'I want you to take some friends of mine to Ljubljana.' As easy as that, she arranged everything, and even made her friend promise not to take our money as thanks (though we managed to give him some anyway and made him promise not to tell her). Early the next morning, we loaded up the car and left, in disbelief at the rapidity of events and how swiftly the world had turned upside down."

Hays remembers feeling "as though I was betraying my friends and acquaintances by leaving, by abandoning them."

Hays managed to return to her research in Zagreb in the summer of 1996. "Things were fine in Zagreb then," she says. "In hindsight, we had stayed in Zagreb through all the danger. And in the end, two other Fulbright fellows opted to stay despite being sanctioned by the Fulbright organization. But at the time we didn't know what would happen next and did not want to jeopardize Hazel's safety. I don't think we made the wrong decision."

seen no money since 1993. They work from sunup to sundown getting food, building or repairing dwellings and bartering with other groups. They have several villages in the area. I stayed in one with a population of 20 or so. It was the site of a former prison camp. My host was a riverboat captain and son of a former political prisoners of the camp."

As in other out-of-the-way areas of the former Soviet Union, the villagers no longer receive visits from theater troupes, poets, novelists or musical ensembles. But unlike areas where collective farm equipment sits rusting in the fields and most of the young people have left for the cities, the Old Believers' villages seem to be maintaining their population, and residents make use of every scrap of equipment and material they possess. Some are hoping to attract tourists to their area while avoiding the plague of gangsters that afflict other Russian tourist areas.

Not that the woods are free of plagues. Buck can show scars from mosquito and fly bites that are many months old. The Russian researchers use a special oil to repel them. "They didn't use head nets, but we did. The people who live in the region don't use repellents or head nets. They're very accustomed to them and just casually wave them away. The flies can bite a small chunk of flesh out of you. Sometimes hundreds are right there in front of your face. I think after a while my lack of showering may have discouraged some of them. When you eat, you pray for a strong wind that will carry them away for a spell. Rain doesn't faze them. I took two undergrads from Michigan along with me, and they had no exposed flesh."

The bears, moose, mosquitoes and flies may not have concerned the Russians. But there is the tick. The local variety carries encephalitis and is deadly to the Russians, Buck says. When a visiting researcher pulled a tick off herself, squeezed it and threw it on the ground, the Russians became upset.

"They kill each one with a match," Buck says, "so it will have no chance of breeding. Squeezing won't necessarily do. They're too tough. We had to evacuate a Russian researcher with a tick head embedded under his skin. We looked for a vaccine and bought the last supply at the second of two hospitals we had to drive like the blazes to reach. I decided to call an end to the field season right then because I had no assurances that a next victim could get vaccine. It's 50-50 as to whether you get encephalitis after treatment. Luckily, the gentleman survived. It's wise to get vaccinated beforehand, but I didn't. I'm afraid of needles." **MT**

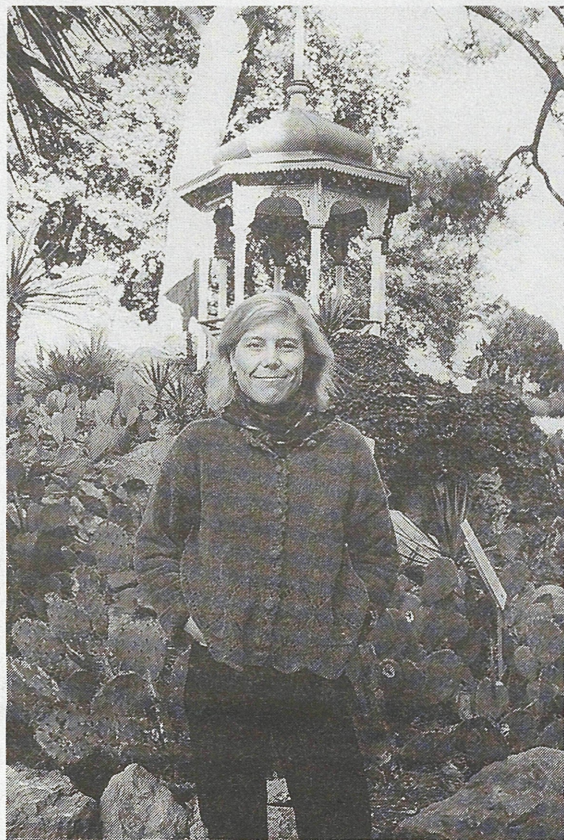
## Greta Uehling How do you account for the homing drive of the Crimean Tatars?

The Crimean Tatars are back in their peninsular Black Sea homeland in Ukraine after Stalin banished them 2,700 miles away to Central Asia 46 years ago. Their eagerness to return—where they knew they would be caught up in Crimea's epidemic criminality, violent political rivalries, shattering poverty and active hostility from the area's authorities—is what intrigued Greta Uehling.

Traveling with locals for safety and to gain cooperation from informants, Uehling studied the Crimean Tatars' repatriation movement for three years. Uehling, who recently defended her dissertation in anthropology, argues that their return was "counterintuitive and exceptional; they were leaving places of relatively greater economic security to a basically criminal environment where there was little housing or employment available and they'd have to live in tent villages just to be in their homeland." The Tatars have displayed a tremendous amount of grit, and Uehling wanted to explain how they got it.

She decided the key was to examine the memories the Tatars forged of their homeland in such cultural forms as song, art and historical accounts. "Since their deportation in 1944, they developed a corpus of memories about a place they remembered as Eden-like," Uehling says. "The question was, how did they develop these memories over five decades in exile when the Soviet authorities seemed to control the representation of history in order to fit the strictures of Communist ideology?"

The Soviet controls in Uzbekistan, where most Crimean Tatars were relocated, included eliminating the Tatars' link to Crimea from textbooks and forbidding them to mention the word "Crimea" publicly, even in songs. But the Tatars defied the laws against evoking their past in the Crimea. All families privately kept the vision of a Crimean utopia alive. Ingenious public resistance techniques flourished, too; painters, for example, would insert symbolically significant trees into their works or use a special color combination that had powerful cultural meanings that the secret police couldn't detect.



Greta Uehling in the Crimea.

Photo courtesy of Greta Uehling

"One of the unintended results of the repressive measures was a buildup of memories so emotionally charged," Uehling found, "that when a student defiantly sang the word 'Crimea' in a song during a school assembly in Tashkent, the Tatar members of the audience burst into tears. Officials immediately took her to the principal's office, and KGB agents interrogated her to determine whether her action was part of an organized resistance."

Traumatic memory played a role in the Tatars' willingness to risk so much to return to a troubled area, Uehling says. "If we consider for a moment that they were suddenly removed from their homes in the middle of the night, loaded on trains and taken from their historic homeland, this makes sense. Added to the psychological trauma was that they saw family members who died during the arduous three-week journey into exile be denied burial. They were simply thrown off the train. All of this they remembered and told their children. But over the years, they tended to replace or add visions of how beautiful their peninsula was to these accounts of hardship. They became so attached to returning that their slogan was 'Homeland or Death.' My youngest informant was 15, and I was struck by her answers to my questions about her

feelings about her homeland—they were the same as the adults'. Even small children will tell you that they have come back 'to be on our historic homeland.'"

Uehling compared the Tatars' response to deportation with other Crimean residents deported around the same time—Germans, Bulgarians, Greeks and Armenians. All grew up under the same Soviet ideology but none of the others formed as strong a movement to return to Crimea. Although all the ethnic groups had many things in common, the non-Tatars "had nations outside the former Soviet Union that could become repositories of identity," Uehling notes.

The Tatars are a Turkic people. They tend to be fluent in Russian but speak Crimean Tatar at home. "Their language is very close to Istanbul Turkish," says Uehling, who is fluent in Russian and speaks some Crimean Tatar. The Crimean Tatars arose from a complex mixture of the indigenous peoples of the peninsula and a branch of the Golden Horde that came to the area in the 13<sup>th</sup> century AD. "The Russians used the word 'Tatar' to describe a number of different ethnic and linguistic groups," Uehling says, "which has confused many scholars and lay persons. It's a term something like 'Indian' in the United States, a word to designate all of those presumably 'wild people' regardless of their origins."

The Soviets deported at least 190,000 Crimean Tatars, every single one they could find, treating the Tatars as if they had collectively collaborated with Nazi occupiers during World War II. Their numbers reached about 290,000 in their exile in Uzbekistan, the Ural Mountains and Siberia by the time they began their return.

The Tatars first attempted to return in 1967, citing their interpretation of a government "rehabilitation decree." But the persistent 10,000 who made repeated attempts to reclaim their heritage were seized as many as 20 times, taken to the border and kicked out. "In the end, only a couple hundred families managed to stay," Uehling says. A full scale return began following Gorbachev's *perestroika* reconstruction and reached its peak between 1987 and 1991.

"When they were finally able to return, the local authorities tried to evict them from what were essentially squatter settlements," Uehling says. "At this time, the memories of what happened to them in 1944 added fuel to their resistance. On some occasions, they even soaked themselves with gasoline and told the authorities to leave them alone or they would all blow up together."

Today, the Tatars make up about 12 percent of the population of the Crimean peninsula, Ukrainians 23 percent and Russians 61 percent. Many of the latter two nationalities were shipped in and given the Tatars' houses and other property. Crimea was considered a part of Russia until Khrushchev ceded it to Ukraine in 1954.

Now, Uehling says, most Crimean Russians would like to realign with Russia, but larger diplomatic issues stand in their way.

Uehling visited Crimea five times from 1995 through 1998. Her main base was around Simferopol, the capital of the Autonomous Republic of Crimea. Crimea, especially its coastal region, is a favorite vacation spot of the former Soviet Union's multiethnic mafia. Gangsters' turf battles continue even on holiday, as they try to control spas, nightclubs, bars and other sources of the tourist industry. Among the players in this violence are the Crimean Tatars.

Paying protection money to gangsters is a way of business life in the Crimea. During one of Uehling's visits a non-Tatar gang was demanding protection money from an elderly Tatar woman who sold goods in the outdoor market. Two Tatar men who stepped in to help her were beaten to death. "After the funeral for the two men, the Crimean Tatars went on a rampage across the peninsula. They destroyed the other mafias' kiosks. Once they're angered, they're effective, and their unity in times of adversity frightens the Slavs."

Unable to reacquire their original property, the Tatars asked the authorities to give them empty lands. For many years the answer was no, so they squatted, and only recently did the land become legally theirs. "Where I lived," Uehling says, "they had first set up a tent village in a former sunflower field. They began building foundations for houses in cooperative teams, then drew lots for the sites. The families hope to complete the houses someday; but right now inflation makes it difficult to finish construction."

Despite their hardships most Tatars went out of their way to support Uehling. "They loved my subject matter," she explains. "They said my topic was *their* topic. Yet the activists I worked with in the national movement had experienced enough repression from the security forces that they tended to be mistrustful of most others. Whoever I spoke with would wonder which of the other Tatars was working for the SBU [the successor of the Ukrainian KGB]. That affected my research because there was an enormous amount of intrigue surrounding what was said. On occasion, I was followed and some even suspected I was from the CIA."

Despite their factionalism the Tatars have managed to establish their own parallel governmental structures to run their internal affairs, including their own elections, parliament and representative body.

Uehling thinks another reason the Tatars supported her was that in the past, "scholars have neglected or deliberately falsified their history." To a certain extent, Russians still use them as scapegoats, Uehling says, falsely portraying them as separatists and fundamentalists and/or terrorists whose presence justifies heavy surveillance and restriction of liberties. Youths especially face serious obstacles. "With few jobs available in a very depressed economy, organized crime attracts them as a viable way to make money. This is compounded by the fact that education is no longer free, and you have to add a considerable bribe to the cost of normal education."

Some of Uehling's informants were criminals, but even they expressed a version of patriotism. "They said they charge fellow Crimean Tatars less protection money than they do outsiders, so they are doing their kinsmen a service."

Uehling found that "being a woman in that dangerous environment was actually more of an asset than a liability, because people wanted to protect me. They often wanted to see me to my next destination and make sure that no one, not even the security services, gave me any trouble."

Even on good days, electricity is intermittent, plumbing scarce and roads unpaved in Tatar areas. Hunger is so bad, Uehling says, that "many die from eating spoiled food or animal food, and not surprisingly they have grown increasingly demoralized living in these conditions over the last 10 years. At the same time, it's a fertile agricultural area, and there is fishing in the Black Sea. Wheat is grown for export, there is a canning industry and a limited amount of mining. But the tourist industry is the most important source of revenue, although a great deal of the money ends up in Kiev, the Ukrainian capital."

Various political factions seem eager to prevent the Tatars from regaining an official voice in Crimean affairs, Uehling says. "The headquarters of the Tatars' national organization is known to be bugged and has been bombed several times, as recently as 1999. The Tatars suspect the local authorities had a hand in the incident because the water and electricity were turned off prior to the blast."

Once when the Tatars were demonstrating in the town square against police brutality, Uehling wanted to participate, but in light of occasionally violent police actions, her Crimean Tatar family firmly convinced her she'd more likely complete her project if she stayed put.

"I knew what I was getting into, but sometimes it was difficult nonetheless," she says.

MT

## Luke Bergmann What is childhood in a postindustrial, rustbelt city?

"I spend a lot of time in vestibules," says Luke Bergmann, a doctoral candidate in social work and anthropology.

"Woah, Luke, you're making us hot," the young Detroit drug dealers he's studying will say when they spot a police cruiser. That's when Bergmann takes cover. "It's not the kids who are threats to me but the police," he says. "No kids have ever harassed me, but police have plenty of times."

After a three-year gap during which he worked as a carpenter in Ann Arbor, Bergmann returned to U-M for graduate school because he decided he wanted an intellectual challenge and had been interested in ethnography. He intended to work with youths returning to their communities after serving sentences in juvenile correction facilities. "This is known as 'reintegration' in social work parlance," he says.

But after discovering how "strikingly important the drug trade is to kids in Detroit," he decided to concentrate on youths in the trade who were moving in and out of the downtown Wayne County Juvenile Detention Facility. "Eighty-five percent of the kids I spoke with in detention said they'd been involved in the drug trade," Bergmann says, "but I suspect that 'only' 45 percent really had been involved, because it boosts their status to claim they were in the trade."

In a project approved by federal and U-M research review boards, he spent months observing and building relationships with the youths and staff, then began life history interviews. "I saw that many develop a sense of identity through their involvement in the drug trade," Bergmann says. "The Juvenile Detention Facility is equivalent to a jail. Youths from ages 8 to 17 go there either before trial or post-adjudication and pre-sentencing. It's a maximum-security facility with two tiers, no windows that show anything other than a patch of sky, and no fresh air. The county built the facility for about 150 inmates but the number in it is usually 180. The system is so bogged down some kids are there for well over a year."

With approximately 4,000 youngsters, most of them males, going through the facility a year, the 50 percent or so rate of repeat offenders means that perhaps a fourth of the 8- to 17-year-olds in Detroit have served detention, Bergmann estimates.

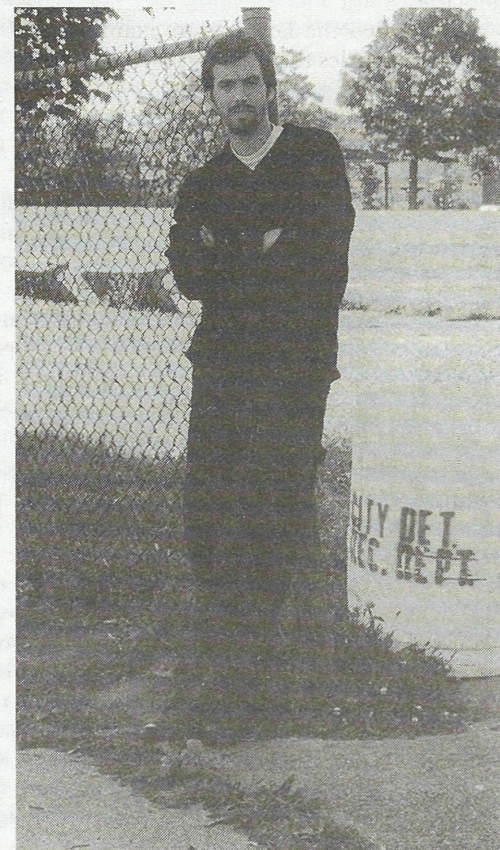
"The concept of reintegration imagines a healthy and discrete community to which a detained person can return," he says. "It supposes that there's an organic, separate community distinguished from the punitive state institution. But in fact, the juvenile detention facility is a key part of Detroit community today. That's a big change from the past. The actions of the detention facility, courts and police department mean that the state is molding the community."

After getting to know some of the youths Bergmann began to hang out with them by invitation into their communities. "It's a tricky thing to negotiate. I face lots of suspicion from some of them, from adults in the neighborhood, the police or federal drug officials. There's no formula for developing those kinds of relationships with the kids. Nothing I can say will prove I'm not with the feds or police. What's most tricky is that I'm a liability even if the kids believe me. If the cops see me around them, they take me as a participant in a drug deal and will rush over in the hope of finding drugs that they can use to prosecute the kids."

Key to Bergmann's success in his project will be keeping his good relationships with kids with a lot of clout. "Key informants prepare the way for me in neighborhoods that would otherwise be very hostile."

Most of the youngsters Bergmann is close to are school dropouts. The few who do attend school go irregularly. In general, however, he says, "lots of kids who deal do go to school. They describe the marketing pattern

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Luke Bergmann in Detroit.

Photo courtesy of Luke Bergmann



**Luke Bergmann**  
**What is childhood in a postindustrial, rustbelt city?**  
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as, 'Sell crack at home (meaning in the neighborhood), weed at school.'

"It's a highly improvisational and fluid business now. People continually change relationships with other sellers and customers. The supply route and commodities change as well. No rigid military chain exists now, as it did when Young Boys, Incorporated, ran the trade. Even those with those with 'drug-gang' affiliations, such as the Chicago-based Gangster Disciples, tend not to sell for the gang. Now it's run according to a kin-based rather than bureaucratic model. Not that the kids are really kin, but they are fictive kin, developing and using loyalties like those in large families. A few powerful gangs used to dominate, but now there are lots of little gangs, and they don't have much to do with selling drugs. Kids talk about the two activities, selling drugs versus gang-banging, as alternative and sometimes mutually exclusive life styles for them."

The kin-based model has reduced violence in the drug trade so far, Bergmann adds, although Detroit's police remain among the country's deadliest, and the city's homicide rate also continues to be among the highest.

"In the community or even within a 'family,' guys sometimes do get violent with one another," he continues. "It could be anything: a stare, an insult, bumping into someone. People end up dead for this sort of thing all the time. Violence is minimal within the trade, however, and is usually between customers and dealers. Most everyone is armed. 'When you get in the game, carry a heater,' they say. I hear gunfire all the time but I've never seen anyone brandish a gun. Lots of violence is performative. Daytime drug-hustlers go off the clock at 7, go to a bar or strip club, get drunk, pick a fistfight, and from there it often escalates to weapons."

The trade is lucrative. "The kids make \$200 to \$500 a day," Bergmann says. "Some get a weekly wage, others buy and resell. Some get 'fronted' a certain amount of dope and can keep whatever they make over the provider's agreed-upon profit. Some get \$1,000 a week just for just sitting in the 'spots' where the deals go down. Most cultural consumption is on clothing. They spend their money as fast as they make it. Some buy \$150 athletic shoes every week and pay with wads of cash. When their laundry gets dirty, they toss it and buy expensive new clothing. They buy clothing and jewelry for girl friends. The store personnel obviously know that this money doesn't come from paper routes."

Very little of the money benefits their communities, Bergmann says, because "you can't get credit to invest in a house or business if you've just got bundles of cash you can't account for. What they desire most is to get both legal and illegal money, because a source of legal money can provide a cover that could let them get a loan for other purposes."

Some of the young men are "extremely intelligent," Bergmann says. "If I visit them in detention, they can converse with impressive depth about politics, race relations and other subjects. On the street, though, there is very little social space for such conversations."

All of these findings Bergmann analyzes in an effort "to look at how the category of childhood is constructed in this part of Detroit: What is childhood in this postindustrial, rustbelt city? The institutions through which he focuses—the juvenile justice system and the drug trade—overlap, "and they frame childhood; the sentencing of children as adults shows this."

The neighborhoods, in turn, see the drug trade "as a source of money for children, so that children can get consumer goods," Bergmann says. "It's how kids in the inner city learn about capitalism; it becomes their model for production and consumption."

Few of the youths think much about their adult lives, Bergmann finds. Many don't expect to get very old. But many of those who think of adulthood say they want to be lawyers. "They see lawyers all the time in the center, in court. They see lawyers as people who hustle like them, who make a lot of money in ways that are structurally similar to theirs, and who like to wear fancy clothes."

Others just want to get some little job somewhere when they "get out of the trade." Some go into the military, but "quite a number think it would be nice to be a police officer," Bergmann says. "They say the bigger, well-known spots could survive only with police protection, so they don't consider becoming a cop to be such a stretch." **MT**

## Letters

### Star-Catcher

THANK YOU for sending *Michigan Today* to Susan R and Craig P Colby. Actually, only Craig is a U-M grad (LSA 66). Alas, I married UCLA. This year she lords it in football and in culture. Only one sentence into your fall issue she noticed the line, "[G]o and catch a falling star," attributed to Ben Jonson. In fact, John Donne wrote the line that has become part of our common culture, continuing with, "Get with child a mandrake root." Please bury your gaffes more deeply in the magazine where casual readers will not notice them.

Craig Colby '66

Email

I AM a loyal U of M law school graduate (class of '68), and I read with great interest your recent article about Prof. Alec Gallimore. I don't know much about rocket science but I do know my English poets. It was John Donne, not Ben Jonson, who challenged his readers to "Go and catch a falling star." The poem (which Donne called a "Song") continues:

Get with child a mandrake root,  
Tell me where all past years are  
Or who cleft the Devil's foot;  
Teach me to hear mermaids singing  
Or to keep off envy's stinging,  
And find  
What wind

Serves to advance an honest mind.

Richard L. Herrmann

New York City

*The misattribution of John Donne's famous Song, "Go and Catch a Falling Star..." to Ben Jonson continues to plague my thoughts daily and nightly, and to give me new and acute insight into the custom of hara-kiri. My empathy was reinforced when I learned that, thinking of Victoria (the city, not the queen), I had inserted into Canadian Keith Taylor's story on Canadian Dean Shirley Neuman that the University of Alberta was in British Columbia. ("Most Americans don't know any better anyway," one Canadian caller said, almost sympathetically.)*

*In a phone conversation with a wise reader, I appealed for help in analyzing how I could have committed two whopping and mortifying errors that I would immediately detect, not to mention scoff at, if someone else published them. Do my neurons now have a mind of their own? I wondered. "Don't waste time thinking about it," she advised. "Just say, 'I did it because I'm stupid' and get back to work." I'm working, I'm working!—Ed.*

I ENJOYED reading the fall issue, especially about Alec Gallimore (who I know from recruiting for the College of Engineering). Also, the article on clubs and intramural sports was interesting. As a very unique team, one of

brains and brawn, you might consider a short article about the Human Powered Submarine Team.

Celia A. Eidex

Graduate Program Coordinator

U-M Naval Architecture & Marine

Engineering Dept.

Ann Arbor

See story on back cover—Ed.

EITHER YOU misquoted Star-Catcher Alec Gallimore on page 4 of the Fall 2000 issue or he goofed in reference to the speed of light: "We can only go one-tenth of that speed now." One-tenth of the speed of light is 18,600 miles per second, which equals 66,960,000 miles per hour. One of you meant to say that we can only go about one-thousandths of the speed of light. Other than that "astronomical" boo-boo, I really enjoyed the article.

Fred Schmidt '67 BSME, '69 MSME

Email

*Our error. Professor Gallimore said, "We can go only one-ten-thousandth of the speed of light now." Also, the engine he is pointing to on p. 3 is a Hall thruster, not an ion thruster like the one powering NASA's Deep Space 1.—Ed.*

THE article on Alec B. Gallimore's involvement with electric space propulsion was of particular interest to me. I came to the U of M after five years at the NASA-Lewis Center, much of which was involved in electric propulsion (EP) research and development. I was a member of the team that developed the mercury ionization "Kaufman" engine that was flight tested in the SERT test series. I also worked on alkali metal contact ionization engines. EP always impressed me as having a lot of potential. It's nice to see that my confidence has been confirmed.

Richard A. Terselie '65 Rackham

Derwood, Maryland

### 'Prepared for Diversity'

STUDENT diversity is a laudable ideal but reverse discrimination to achieve that goal is questionable and a blunt instrument. Your "Around Campus" affirmative action article in the Fall *Michigan Today* appears one-sided and lacks depth. Specifics to enlighten "the growing body of research" cited by General Motors would be helpful. What are the facts that support the conclusion? U of M, according to the *San Diego Union*, gives minority applicants a full grade point boost on a 4-point scale. Who decided this arbitrary figure? How does minority student average GPA compare with the general student body after their freshman or sophomore year?

How many tutorial hours are devoted to minority students versus the general student population? Where are the statistics on minority student population graduation rates? What are the trends?

My Michigan student experience in the late 1960s prepared me for diversity in life and the working world without exposure to minority voices in my classes. Other avenues presented a path. Summer and part-time jobs brought me interaction with minorities in the general population. Learning to expand thinking, research, explore, organize facts, analyze, critique experimental findings, problem-solve, develop interpersonal relationship skills, and speak and present a position, are skills I took away from my superior education at Michigan. Each skill can be called upon, like drawing a specific arrow from a quiver.

After graduating, I joined the Labor Dept. and devoted 14 years to administering job-training programs. These programs primarily targeted and served minorities. My first supervisor in Denver, a Hispanic, introduced me to Southwest Mexican-American culture and their significant issues. Spanish classes at U of M gave me a very handy skill, fluency in Spanish. Speaking Spanish served me well interviewing migrants in Colorado and Chicanos in the barrios of East L.A. A Black supervisor in San Francisco was the best boss I ever had. I worked on the Navajo and Ute Indian reservations. Moving father West, I also worked with Polynesians and Asians in Hawaii and American Samoa. Try teaching a management concept when there is no Samoan cultural equivalent. Not hearing minority voices first in a class at Michigan did not impair my adaptability or working effectiveness in the public policy arena.

Another career beckoned me, yet I have never forgotten the richness of life I found in helping diverse races. Now I enjoy other riches. I hope those minority students who were cut some slack for admission merit their gift, a powerful privilege, and make good use of it.

Recently, I dined at an upscale gourmet restaurant in Ranch Santa Fe. The blue stone on my U of M alumni ring sparkled in the tasteful spotlighting as my spoon slid into the *crème brûlée*. Around the corner a photo graced the wall of fellow Michigan alumnus, President Ford, with the Swiss chef and owner. No minority member photos adorned the walls. Outside, limousines idled while chauffeurs bided their time. During the course of the Atlantic salmon wrapped in a trout mousse, my wife pointed out a handsome young Black couple dining alone in a corner. They appeared like black swans who mysteriously landed in a secluded pool of Caucasian, old-money patrons.

After dessert I paid with my U of M affinity credit card and launched a percentage back to Ann Arbor. Twenty-eight years ago I dined with my fraternity brothers at the University Club in Detroit. I vividly remember a scene of all elite, educated, white diners and all Black waiters. Change, alas, is

very slow, and Maslow's hierarchy is still a challenge to climb for many minority members. The educated cream continues to rise to the top, and unfortunately it still is almost always flavored vanilla.

Paul W. Wickstrom '70  
Vista, California

I WAS disappointed to see that the good president is still in favor of disenfranchising those who don't meet his standards of victimization. Sacks & Thiel wrote in their excellent book *The Diversity Myth* that "those persons complaining about oppression are generally not the ones who have experienced it first-hand."

To cook the books so that white males must suffer reverse discrimination can hardly meet the standards of equity that our great Constitution envisioned. Oh, I know the trite rejoinder about slave ownership, etc. That no longer cuts the ice. Victimization is a great ploy of academicians and ill serves both the supposed beneficiaries and those who attempt to gain admittance but cannot because they are displaced by a person to whom preference is shown, for example to the Law School at U of M.

I know of no reliable study, one funded or conducted by a disinterested party, which shows conclusively that so-called diversity enhances the true learning process. That does not mean I oppose admission of a variety of applicants for admission who *all* meet the same standard. I just doubt the subjective assertion about the almost inestimable value of diversity.

If it is so valuable then why does it happen, as *60 Minutes* demonstrated in one of its exposes, that like groups congregate and in some instances demand separate buildings on campus?

G. M. Freeman '50 MA  
E-mail

#### Natalie Zemon Davis

AT LAST, the article I have been looking forward to for years. I am referring to "Something Always Bubbles up" (Fall 2000), the interview with Natalie Zemon Davis and the discussion of the targeting of her husband, Chandler Davis, by the House Committee on Un-American Activities in the 1950s. The U-M collaborated with the Committee; as a result, Davis was sentenced to six months in a federal prison.

I first met Chandler Davis nearly 40 years ago in connection with the Marian Davis Scholarship fund that had been set up by his father, Horace Davis, as a memorial to his wife. Chandler and his sisters, as well as others, serve on the board of the Fund, which "aids people active in movements for progressive social change. These needs-based scholarships are awarded to students who are able to do academic work at the college level and who have shown a commitment to social and economic justice."

About 30 years ago, while I was doing re-

search for my book *Africa Counts: Number and Pattern in African Culture*, I learned about a prisoner, Frank Chapman, who had been writing about science in Africa while he was interred in a Missouri prison. I began to correspond with him, quoted him in my book, and was able to connect him with the Marian Davis Scholarship Fund to finance his studies while in prison. With the help of the Fund, he earned a BA degree from the University of Missouri and a Master's in Anthropology from Washington University prior to his release from prison. The Fund (now the Davis-Putter Scholarship Fund in Newark, New Jersey) continues to carry out its important mission.

Thank you for publishing this article. Let us hope that we never have to live through another such period of severe infringement of the right to free expression.

Claudia Zaslavsky '38 MA  
New York City

THE FALL 2000 issue just arrived last week, and I must commend you and your staff on an excellent publication. For a historian such as myself, the article on Natalie Zemon Davis, Anthony Lewis, Vaclav Havel and the new dean [LSA's Shirley Neuman], were all highly rewarding. Good job!

Gregg Wolper '82  
Chicago

GOOD INTERVIEW with Natalie Davis. I arrived at the University shortly before the episode that led of the dismissal of Nickerson and Davis. Both went on to become quite distinguished in their fields, as did Markert. In contrast, Clardy, who initiated the investigation as a member of the House Un-American Activities Committee, never got elected to anything before or afterwards. Hatcher's relations with the faculty were, in my opinion, irretrievably poisoned by the entire affair, although he often claimed that he had staved off a wider investigation.

David Kessel '60 PhD, ScD  
Professor of Pharmacology and Medicine  
Wayne State U. School of Medicine  
Detroit

#### Advice on Naming

TWO YEARS ago A. Alfred Taubman, a shopping center developer, donated \$30 million to the architecture school, which resulted in its name being changed to A. Alfred Taubman College of Architecture and Urban Planning.

Recently, he has been implicated in a Department of Justice investigation into price fixing and other irregularities at Sotheby's, where before resigning he was the chairman of the board. Prices were allegedly fixed as far back as 1993 for both buyers and sellers at Sotheby's in NYC and Christie's in London.

Hopefully, Taubman will be exonerated, but if he is convicted or pleads guilty to avoid a trial, where does that leave the University and the College of Architecture? I've had

reservations, along with other alumni, about naming the College after a developer rather than an architect. I feel Colleges and Departments should be named after professors or graduates who have achieved greatness—money should not be the determining factor. I'm certain the alumni of Yale of Princeton would not be pleased if the name of their school was changed to the Donald Trump College of Architecture, no matter how much money was involved.

The architecture school has had a number of professors worthy of this honor, including Eleil Saarinen and William Le Baron Jenny. Certainly Raoul Wallenberg, our most outstanding graduate, would have been an ideal choice. The big questions are: If Taubman is found guilty and his name remains, we might as well toss the subject of ethics out the window. Unfortunately, situations like this are often ignored knowing that in time they'll be forgotten. But this approach could put the University in a bad light and would certainly leave the College of Architecture under a cloud for some time. The Taubman affair clearly indicates that there are inherent dangers in naming Colleges or Departments after "live" donors.

Roy A. Euker '58 Arch  
New York City

#### Co-ed Broomballers

AS I WAS leafing casually through my Fall 2000 issue, I did a double take on one of the captions relating to the story "The Victors are Valiant." Imagine my surprise to see that the broomball team still refers to its members as "men" and "co-eds." My first impression was that the story was one of those pre-WW II reminiscences. But in fact, the story was about current student activities. Tradition is wonderful, but can't your editors please enter the non-sexist 21<sup>st</sup> century and start referring to team members as "men" and "women"?

Deborah Thomas '73  
Email

*In this instance, "co-ed" refers to squads composed of female and male members, and is not used as a synonym for "women."—Ed.*

#### 'Acts of the Apostles'

WHAT MOTIVATES this letter is Norman B. Davey's letter about the "Acts of the Apostles" story in your summer issue. I was particularly interested in his reference to working there in the Thirties. I started there as a dishwasher in 1937, soon became a waiter and continued until 1939. I enjoyed my three years there and even lived in a room at [the Apostles' cook] Mrs. Parks's house for two years.

Richard W. Stark, '40  
Pinellas, Florida

#### The British in Belfast

AMONG the letters published in the Fall 2000 issue, Henry Kennedy characterized Lin Baum's description of British soldiers

"training rifles on pedestrians" in Belfast to be "absurd." While driving through downtown Belfast on October 10, 1997, I was aghast to witness a crouching soldier, assault rifle held waist-high, suddenly whirl and swivel the weapon from side to side on a sidewalk where workers and shoppers strolled casually. Clusters of other soldiers held their weapons at ready. Though security for so-called "peace talks" at Stormont Castle a few miles away was understandably tight, such behavior appeared menacing at best. Dr. Kennedy, it did happen.

Howard J. Stein, '61 PhD  
Email

#### Prisoners and Art

I WAS deeply moved by Sarah Beldo's article, "Drawing Prisoners Out" in the Fall 2000 issue. I would like to congratulate Ms. Beldo and Prof. William R. "Buzz" Alexander for their far-reaching compassion and humanitarianism.

People in prison are human beings, bear much in common with you and me and have often endured horrible things that we cannot even begin to imagine.

People in prison are too often there because they have committed the "crime" of being poor, illiterate and of a minority group. The sooner we recognize this as a nation that believes in "justice and equality for all" and cherishes individual freedoms, the sooner we can hope to achieve a truly free and safe nation for all. People like Ms. Beldo and Professor Alexander have put us on this path with their bold and compassionate leadership. They are our nation's true heroes and heroines.

Beth R. Miller '73, '77 MSW  
Monroe, New York

#### Druid Secret Revealed?

BOB BERGER wrote you last issue about the Druids Honorary Society. He said: "I was privileged to have been elected to the Druids." Actually, no one was ever elected to Druids, or Michigamua, for that matter. We were "tapped." Tapping was an easy task when you were, as I was in 1963, 6 feet tall, 120 pounds. Tapping meant being dragged out of bed in the middle of the night, stripped



'Bob Berger is one of the guys painting us green,' writes alumnus Lowenstein (inset) about his fellow Druid, 'and I'm the wise guy with his head up who wouldn't shut up.'

and covered in green paint and brought to the Druid rock near the Diag for a more formal induction ceremony, which involved such things as assuming the official Druid tree formation and receiving your official secret Druid name based on a species of tree.

Alliteration was preferred. I was "Library-Loving, Left-Leaning, Lit-School-Leading, Liberal Locust Lowenstein," or something like that. I have prevailed upon the curator of the Druid Archives at the Harlan Hatcher Graduate Library to release some photos of the 1964 induction ceremony, which, among other things, shows Mr. Berger, green paint dripping from his official secret Druid paint brush, standing over me and the new class lying on the ground near Druid rock.

Although I was easily tapped, my classmate and co-inductee captain of the hockey team managed to wedge himself into his closet and Berger and his entire group of senior Druids (including several linemen on the football team who went on to NFL careers) were unable to dislodge him, thus leading me to conclude that, pound for pound, hockey players were the toughest.

Yes, we did have a secret room in the Union tower, but, as Mr. Berger well knows, we are not permitted by ancient tradition (or our lawyers) to reveal any more of our ceremonies or even if the Society, and room, still exists. Surely Mr. Berger remembers that part of our secret ritual involves a certain disfiguring of native tree species, thus provoking the wrath of environmentalists who might try to occupy any secret room we may or may not have.

This much I may reveal: in the same manner as the National Student Association was later revealed to have been funded by CIA, Druids and the other secret honorary societies (Michigamua, Sphinx, etc.) have been exposed as secretly funded by the U-M Alumni Association, as a technique for promoting large contributions by increasingly brain-addled and nostalgic alums. It sure has worked in my case. I've already made my reservations for Homecoming '01. By the way, the Grand Druid has reminded me to mention that Mr. Berger owes us some 37 years of back membership dues, plus interest. He may send the check to me and I'll take care of it.

Roger Lowenstein '64  
Los Angeles

#### Dealing with Autism

YOUR magazine makes me very proud to be a Michigan alumnus. I graduated in 1970 from LS&A with a BA in mathematics. My early career was very disoriented. I had lost interest in pure math, not wanting to be used in anything having to do with the Vietnam War. You could say that I knew what I didn't want to do but had no idea what I wanted to do.

This was all complicated by what I didn't know at the time about myself and didn't find out until 1995, when UCLA's experts diagnosed me with Asperger's Syndrome, a very high-functioning form of autism, probably what is also shared by such as Albert

Einstein, Bill Gates, Howard Hughes and Thomas Jefferson. People with this condition often have good intelligence and appear so normal, except in the area of social communication and relationships, that people wonder why people like me can spend almost twenty years as a taxi driver.

On the way to my self-discovery, I saw *Rain Man* in 1989 and being a savant in numbers and memory, I became active in the Autism Society of America. I co-founded a support group in 1993 and met Mary Meinel, another savant with Asperger's Syndrome. We married in 1994, divorced in 1999 and are now living in Tucson, where I hope to get a PhD in applied mathematics. In 1996, we and our support group AGUA (Adult Gathering, United and Autistic) were featured on *60 Minutes* (9/29). Now that we are together again, Mary and I plan to start a couple of new support groups in Tucson and Phoenix. I am a frequent speaker all over the world on issues of adults with autism and will be on the *Today* show Friday, April 27, to help start CycleUSA, a campaign in which parent, John Keating, will ride his bicycle 7,000 miles to San Diego, to raise ten million dollars for autism research.

None of this would have happened without the positive, community oriented experience of my Michigan years. Between my friends and my wonderful brothers at Delta

Chi Fraternity, I always had faith that some day I would figure out a way to be a productive and happy citizen of the Universe.

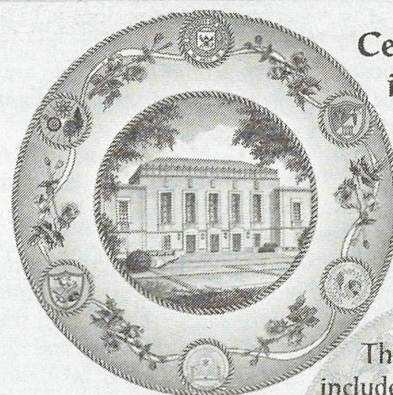
Jerry Newport '70  
Tucson, Arizona

#### Recovering From Floods

THIS IS an appeal for help for the victims of the January 26-27 earthquake in Gujarat, India. We are coordinating efforts with our friends who have reached Bhuj, the epicenter of the quake, to get donations directly to the NGOs (nongovernmental organizations) working there. The latest media reports speculate that the final figure could be as high as 75,000 killed and over 50,000 injured. Many thousands have been rendered homeless. I would be greatly obliged if you could print it in your edition that people who would like to help can visit [www.growthcircle.com](http://www.growthcircle.com) and register where they would get an update on what efforts are being done and how they can help or even send in small sums of money to these NGOs working there. Persons who wish to learn of specific needs as they arise may contact me at [tparikh@umich.edu](mailto:tparikh@umich.edu). I promise they will receive no junk mail or forwards, and only be contacted by me when the time arises.

Tanvi Parikh,  
Masters in Urban Planning Program  
Ann Arbor

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By Britt Halvorson  
(U-M News and Information  
Services)

Some guidelines (but no easy lessons) on:

# WRITING BETTER

**W**hile taking a creative writing course, Cherisse Montgomery, a third-year English major from Detroit, decided to get help with character development and dialogue in one of her short stories.

Despite feeling apprehensive ("because I'm shy," Montgomery explains), she stopped by the Gayle Morris Sweetland Writing Center in Angell Hall to see if the staff could help her.

The Center was founded in 1997 through a gift from U-M alumnus John Sweetland in memory of his wife Gayle, who was the owner and publisher of *U, the National College Magazine*. Any student taking courses in the College of Literature, Science, and the Arts or majoring in an LSA discipline may draw upon the Center's composition resources and its instructors' one-on-one writing help in 30-minute appointments.

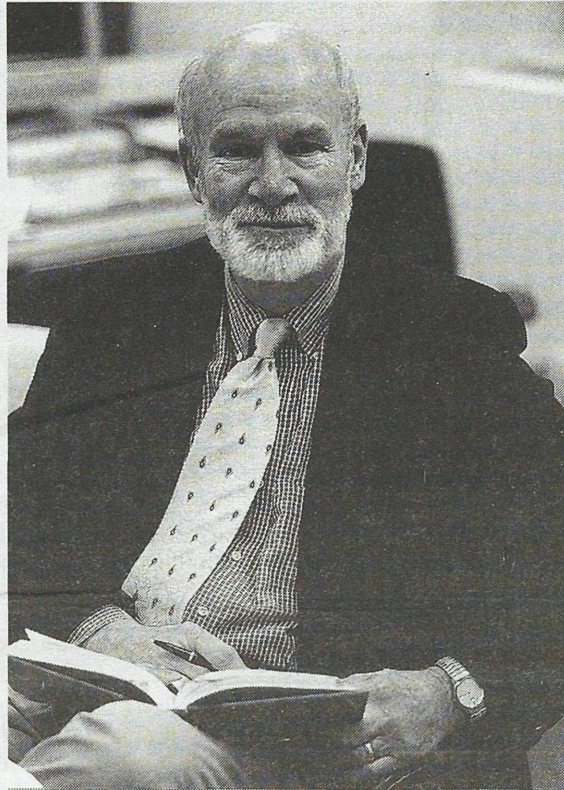
Despite her initial anxiety, Montgomery's visit put her at ease, and one year later she continues to make regular appointments at the Center for feedback on her poetry and short stories. Whatever she has learned must have been helpful, because she went on to win a Hopwood Underclassman Writing Award.

Senior Beth Bernstein of West Bloomfield, Michigan, first met with one of the Center's instructors to discuss the essays she wrote in a first-year English class that required students to use the Center. "I learned that patience, time and effort are essential elements" to expressing ideas clearly, says Bernstein, who has visited the Center once a week ever since to discuss papers she is writing.

"Writing is not an instant creation," says Ejner Jensen, director of the Center and professor of English. "It's a fairly lengthy process of trying things out, making sure they fit, making sure the kind of evidence you need is there and available to a reader, and making sure the assumptions that you have aren't just there in your own head."

Jensen and the Sweetland Writing Center faculty and staff have designed programs to address undergraduate writing; upper-level, discipline-specific writing; composition pedagogy for faculty and graduate student instructors; high school curriculum; and instructional technology for composition.

The ability to find a thesis, identify it, and enlarge the argument as the essay progresses are the most common issues the Center's staff address. "The Rules" of composition taught in many high school courses may impede student writing. For example, the "Never the First Person" rule, Jensen says, often



*"If you don't have an extensive vocabulary, you can't find that verb that really generates a lot of zip," Jensen says.*

Photo by Britt Halvorson

leaves students unsure of how to "make a claim [in their writing] that involves them personally."

Limited vocabularies also detract from students' ability to sustain an interesting, nuanced paper. "If you don't have an extensive vocabulary, you can't find that verb that really generates a lot of zip," Jensen argues. "You can't find exactly the noun-adjective combination that's going to make somebody notice. There's too much of a reliance on the formulaic, on expressions and phrases that we've already heard."

Last spring, the Provost's Office, the Center for Research on Learning and Teaching, and the Sweetland Writing Center held a seminar on undergraduate writing that brought together faculty members from across the University to discuss interdisciplinary composition issues, as well as discipline-specific writing innovations. John Whittier-Ferguson, associate professor and undergraduate chair in the English department; Patricia Shure, lecturer in mathematics, and William J.

Adams, professor of economics and LSA associate dean for academic affairs, discussed writing pedagogy in their own disciplines.

Whittier-Ferguson spoke of writing as a means both of learning to distinguish "real" questions from ones that will lead into a "merely tidy paper" and of tackling the "real," open-ended, genuinely complex questions of a chosen discipline. "The only way to get deeply into the speculative caverns that are the hallmark of real questions," he says, "and the only way to bring those questions fully before the community of question-askers which is this university, is to write one's way in."

Faculty members' comments on student papers also should continue to emphasize real questions, he adds.

Shure described how writing "solidifies" the understanding of mathematics: "You learn math by reading it, writing it and talking about it."

When students write out their solution to a problem, Shure says, it becomes evident to the instructor where the student is unsure of the mathematical operations. She showed the seminar audience a problem for which a student produced the correct answer using several scrawled calculations worked out on the bottom of a test page. When the instructor asked the student to write out his answer to the problem, it became clear that he had arrived at the answer using a method that would not produce the right result consistently. His writing revealed that he did not understand the operations and concepts the problem meant to demonstrate.

The writing approach in U-M math classes is "still pretty novel nationally," Shure says.

According to Adams, writing is a skill that can be honed to communicate key ideas of a discipline to others who are not trained in that field. He has his economics students read articles from the business press and encourages them to discover the deeper issues within the stories and construct coherent arguments to support and dispute what the pieces contend. His students also read judicial opinions and other primary documents from which they are to draw the implicit issues.

"I'm trying to prepare students to grapple with the full complexity of these cases," Adams remarks. By assigning students pieces that are not written by those trained in economics, Adams impels them to sort out the key economic issues of each piece and articulate the arguments involved. Disassembling an article in search of deeper issues prompts the thinking and organizational process that is essential to solid writing, Adams notes.

The seminar presentations were highly successful, Jensen says, in examining the integral role writing plays in each discipline. Such universitywide discussions "must be extended," he adds, "if we're really going to make a difference in what it means to ask students to be successful, confident writers in their own discipline." **MT**

## Advice for High School Students

Some guidelines for improving writing before college:

- Read, read, read. "Develop your ear for good writing by reading," Professor Whittier-Ferguson advises. Read a variety of texts.
- Write every chance you get.
- Address different audiences and consider different occasions in your writing.
- Look at drafts of your papers and think of revisions. Work on style and check that the thesis is clearly defined.
- Be familiar with the vocabulary of writing, so you can discuss and analyze your own work. "Whether you're discussing a sonnet or mastering the intricacies of automobile repair, you need to be able to talk about the components," Professor Jensen says.
- Find a teacher, tutor or an acquaintance who is willing to read your drafts and offer ideas for revision.

Room, board, service

# TELLURIDE HOUSE

By Cheryl Bratt



The Telluride House at 1735 Washtenaw Ave.

**T**wenty strangers, one house on Washtenaw Avenue, one community service project: Sound like a new reality-based television show for CBS or MTV? Actually, this is the Telluride House, a scholarship program offering free room and board to distinguished undergraduates, graduate students, and faculty members in exchange for their contribution to an educationally enriching, volunteer-oriented, community living situation.

Originally an association to boost electrical engineering in the West, the Telluride Association has educated young people since the turn of the 20<sup>th</sup> Century. The association was founded by Lucien L. Nunn, an electrical power entrepreneur mining the Rocky Mountains who was dissatisfied with the lack of electrical engineering students willing to relocate to Colorado after being schooled in the East. Nunn established the Telluride House in 1910 on Cornell University's campus, striking a deal with students: he would pay for room and board if they would work for him once they finished their schooling.

The success of Nunn's association skyrocketed, and he broadened his idea to encompass various educational departments, envisioning a diverse and intellectual living community. Today, the Telluride Association prides itself on its devotion to the synthesis of volunteerism, education and community living that is intended to cultivate the character of its members.

It has taken almost a century for the association to reach U-M. Earlier, it set down at the University of California at Berkeley and the University of Chicago but did not take root there. U-M had sponsored Telluride's summer programs for gifted high school students, and that program's success led the association to select U-M as its Western hub.

According to Sarah Nelson '02 of Lexington, Kentucky,

"The University of Michigan was an obvious choice. Telluride wanted to steer away from the Ivy League schools, while finding an academically reputable institution for a new house." U-M qualified because of its dedication to public education and the rigor of its undergraduate and graduate programs, she said.

The conversion of a defunct sorority house into the Telluride camp was completed only a few months ago. The house focuses on joined living and cooperative, inspiring interaction. Emily Ahonen '01 of Temperance, Michigan, an original member last year's pilot program, says she has been "pleasantly surprised by how much easier it is to plan and implement things when there is not only a stable place to meet all the time but also a place to post announcements, requests and ideas. That way, people know what's on the agenda for a meeting ahead of time and can think ahead. That's key when there's always so much to take care of in a short time."

Because this is the first year of the living community on campus, the house is struggling with various group conflicts, but members seem enthusiastic about its success. "I think this house has the potential to be great for this campus, but this first year will take a lot of work to make that happen," says Lee Palmer '01, a political science and Spanish major from Lincoln, Massachusetts.

This year's house includes 17 undergraduates (two of whom are freshmen), one graduate student and two Law School students. Two faculty guests, usually academics conducting research at the University, also live with the students. This year professor Xavier Nicholas from Tuskegee University and professor James Ogude from the University of Witwatersrand in South Africa are visiting U-M.

The house hopes to reach a membership of 25 to 30 people who span age, academic concentrations and years of schooling. "Graduate students have more outside world knowledge than the freshman," states Purvee Parekh, a second-year law student, "but overall, I don't notice major conflicts between the age groups."

Run similarly to a co-op, Telluride practices democratic involvement and group cooperation. House meetings are mandatory and are held every other week to allow members to discuss various topics and projects, and to promote group unity. The house elects five council officers to oversee public relations, finance, Telluride Association relations, internal relations and projects. Besides the council, each member works on various committees for the house, organizing social events, recruitment and publicity.

When asked why they joined Telluride, right up there with the obvious boon of free room and board, members cited the various invited guests, public lectures and year-long volunteer project that the house sponsors. "I wanted to be involved in community service, and this was a good way to do it, where it would be incorporated into my daily life," explained one member who chose to remain anonymous.

This year's project, Arts in Ann Arbor, focuses on Dickens Elementary School. Recent budget cuts have weakened creative arts programs at local schools, so Telluride stepped in to recruit artists and performance groups to Dicken in south Ann Arbor. **MT**

Cheryl Bratt '01 of Yorktown Heights, New York, is Michigan Today's 2000-01 student intern.

## NEW RESIDENCE HALL TO IMPROVE UNDERGRAD LIFE

Student housing has drawn close attention from the U-M administration this year. In February, the Regents approved a general plan for renewing the University's existing residence hall facilities and building a new residence hall, the first such construction on campus since 1968.

"We must understand that the quality of students' residential life is connected intimately with their academic experiences," E. Royster Harper, vice president for student affairs, told the board. "Not only do we want students' living environment to support and enhance their academic achievement in the classroom, but we also will be looking for ways to foster additional learning communities within our residence halls."

The plan calls for renovation of the 15 existing residence halls and construction of a new facility. Harper noted that details such as location, size, features and cost will be determined at the end of a planning process that is to include extensive consultation with students, faculty and staff, site visits to other schools and research into campus housing trends nationally.

U-M Provost Nancy Cantor said recommendations that will emerge from two presidential commissions—one focused on the undergraduate experience and another on the information revolution—will be a crucial part of the planning process. Cantor chairs the Commission on the Undergraduate Experience. Both commissions are expected to issue reports this spring.

# Ashoo Jain

## A smash in the world of table tennis

By Joel Seguire

**A**shoo Jain '01 plays table tennis. But it's a different game than all but a few of us know.

He can see the 7,500-rpm spin on a ball coming toward him at 100 mph and react to it in that split second with counter spin and power to win the point. He moves with the quickness of a lightweight boxer and the grace of a dancer. He's a gifted athlete and a passionate competitor. And he's a member of the U.S. national team that will compete in the 2001 World Championships in Osaka, Japan beginning April 23.

Ashoo Jain (pronounced ASH-oo Chan), a senior in the College of Engineering's mechanical engineering department, is one of just five Americans selected for the national team at trials held in San Diego in February.

The road to selection was a minefield of tough competition. Jain went 4-4 in the preliminary round, good enough to advance to the final round of 12 as the 11th seed. Facing some of the top players because of his low seeding, he won only one of his first five matches. But, despite a strained and knotted chest muscle ("I overdid the strong forehands"), he battled back to win four out of five to finish 5-5, earning fifth place in the tournament and a place on the national team.

A dream has come true for Jain even though the reality "still hasn't sunk in completely," he said just before packing to leave the campus in mid-February. "I won't feel the full impact until I'm doing some damage in competition. It's been several weeks since all the excitement of the national trials, and the feeling I have right now is a kind of depression. Being selected for the team is a great honor, but joining it meant I had to make the decision to leave school three months before graduation and that's been hard. But the excitement and support of family and friends is beginning to pull me up."

Despite the emotional letdown following the trials, Jain says he's thinking of little else than what he's facing in the next months. "I've never been more passionate and focused about anything in my



*'What I've done comes from my heart,' Jain says.*

life," says the 21 year-old collegiate and national junior champion and junior Olympics gold medallist (see box).

Jain reached perhaps the pinnacle of his junior career when he was invited by the American Table Tennis Association last fall to join a group of younger players on a trip to China, an extension of the "Ping-Pong Diplomacy" of the 1960s. The group toured from Beijing, where they spent four days, east to Tianjin, ending up in Shanghai. Jain says they were overwhelmed by the welcome they received.

"Everywhere we went," he recalled, "we were treated almost like royalty. Police escorts to clear traffic. Students lining the streets as we approached a school to play exhibition matches. Flowers, camera crews. We were taken to see a children's opera in Beijing. When we entered the theater 700 people stood up and clapped for us. And the matches were tough. I played a 13-year-old who was the third-ranked junior in the whole country and went 1 and 1 against him. It was all just an amazing experience."

Jain was born in New Delhi, India, where he first became interested in table tennis. Sibling rivalry spurred his development. "My older brother, Deepak, started playing first, and I just sort of followed him. He became a top US junior player and it took me until 1996 to catch and pass him. Not long after that he quit playing—a victim of burnout."

The Jain family immigrated to Edison, New Jersey, in 1990 on the Fourth of July. They have a furniture business near there today. Also nearby is the New Jersey Table Tennis Club, where Jain began working on his game in 1992 at the age of 12. "I didn't really catch on to the sport until about 1997 when I be-

### The Jain Record

- Current ACUI collegiate national champion.
- Member of 2001 US National Men's team.
- Ranked US #2 under-22 group, 1999-2000.
- Junior Olympics Gold Medallist Under 22 (1997-98) and Under 18 Singles (1996).
- Ranked US #1 in Under-18 (1997) and Under-16 groups (1995).
- Eastern Open Collegiate and U2500 Champion (1998).
- Two-time US Junior Team member.
- Millcreek Open Champion, 1999, Erie, NY)

gan to surprise some people," he says. "Everyone thought my brother would be a great player because of his dedication and progress. They saw me as being lazy and lacking determination. It's true I often was kind of casual about playing, but for some reason, things started going right for me after '96 or so, and I really started getting better. It's been up and up since then."

To watch Jain play table tennis is to know that this man has a passion for what he's doing. But he admits he doesn't have a strong work ethic, explaining, "I never have pushed myself very hard and I haven't allowed others to push me. What I've done comes from my heart. I've risen to the level I've reached because I truly enjoy playing this game. I've known too many others like my brother who have been

pushed to the point of burnout, where they hate playing. That's a really sad thing to see."

The field of play in table tennis extends from the net to six feet or more behind the table, several feet either side of it and about two feet below the tabletop. The ball may arch five feet or more above the table on a lob, often launched well back from table edge with heavy topspin. An exchange of lobs is akin to playing the baseline in court tennis. Then there's the smash that ends such an exchange when you see the power of the player sending the ball back to her or his opponent at around 100 mph.

In high-level table tennis, as in court tennis, quickness means getting to the ball and, most of all, spin. The ability to read in a split second the spin on a ball coming toward you at high speed, and to create your own spin in return, separates top players from even the best recreational practitioners.

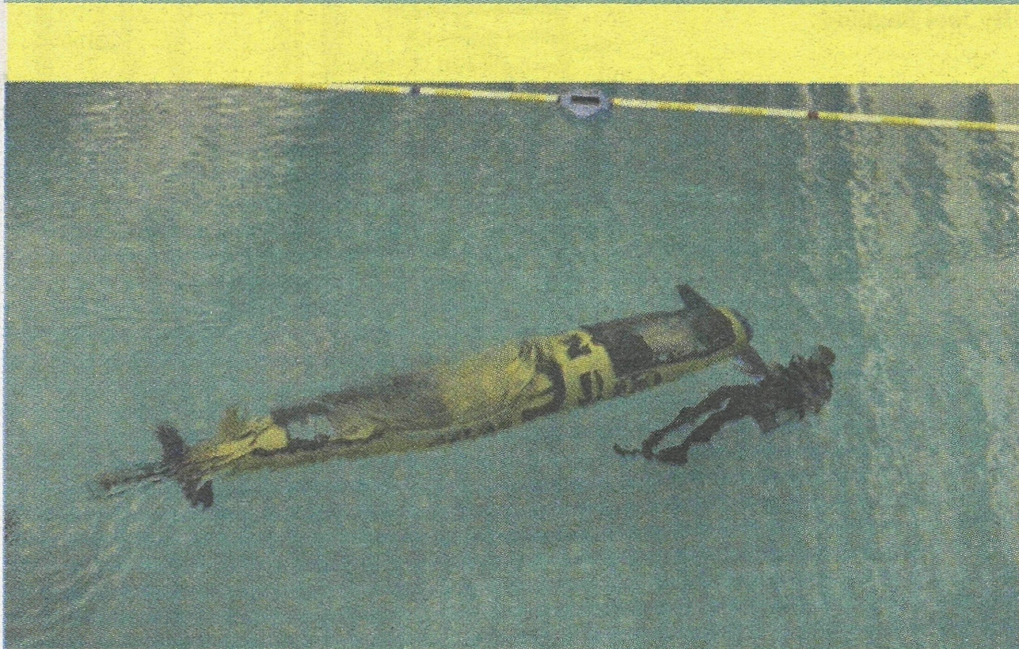
Besides his exceptional talent, and somewhat belying his fierce competitiveness, Jain has a genuinely warm and winning personality, with an easy smile and an obvious joy for life. His personal style has often placed him at the head of the parade, but he's wistful as he looks ahead to the next few months. "I've been a leader most of my life, but as the number five player on the US team, I'll have to start out as a follower, and I'm not used to that." He's not likely to be following for long.

As the voice says, consult your local TV listings beginning April 23 for the World Table Tennis Championships. When you tune in, look for a lanky, intense young man named Ashoo Jain. **MT**

*Joel Seguire is manager of administrative news for U-M News and Information Services.*

# Human-Powered Sub Team Has Chance to Set Record

By Ken Wachsberger



Human-powered sub squad practicing in the Canham Natatorium.

Photo by Martin Floet, U-M Photo Services

The University of Michigan Human Powered Submarine Team is shooting high even as it submerges its latest model in preparation for another test run. Among the team's goals this year is to bid for the human powered submarine world speed record at the upcoming International Submarine Race (ISR).

Team captain Joe Tilchen is confident that lessons learned in the past will stand them in good stead in the attempt during the 6<sup>th</sup> ISR, to be held in June at the David Taylor Model Basin at the Naval Submarine Warfare Center in Bethesda, Maryland.

According to Tilchen, a junior from Novi, Michigan, majoring in aerospace engineering, more than 20 teams already have expressed interest in taking part, including teams from Russia, Canada, and other countries.

Four years ago, the then-one-year old U-M team competed against 16 teams from three countries at the 5<sup>th</sup> ISR, also in Bethesda. They were pleased with their debut performance because their entry, *Sea Woku*, finished the race, a feat not accomplished by every team. Then team members graduated and went their separate ways.

Two years later, with a new crew, including Tilchen, the team began its "ReSurfacing" year (a pun the HPS team puts in quotes on its Web history page to make sure casual readers don't miss it).

In the current squad's HPS race in Escondido, California, last June, its vessel *Atlas* placed in the middle of nine teams from the United States and Canada with a top speed of 2.69 knots (1 knot = 1.15 miles per hour). Their spin: not bad for a team with no previous collective experience.

But this year the team's unofficial goal is as straight as the 150-foot

path they will race: to break the human powered submarine world speed record, which presently stands at 6.977 knots.

Captain Tilchen explains his team's confidence in an early-morning interview at the Wilson Student Team Project Center on North Campus, where the new vessel, *Neptune*, is being constructed. "The need for a highly effective control system was the major lesson learned from the ASME competition. At times it was difficult to steer our submarine. Therefore, the next submarine will have a much more functional steering system."

For instance, he explains, the "angle of attack" refers to the angle at which the fins cut the water when raising and lowering the machine. "When we increased the angle of the fins too much during the race, they acted as a brake rather than a lifter. The new ones will be limited to the maximum angle of attack so the driver can't overdo it."

The new sub will have a counter-rotating propeller propulsion system rather than a single marine-style propeller. Reason: to eliminate the roll problem—the tendency for the sub to roll to one side with the pedal thrust from the other side.

As with *Atlas*, operating *Neptune* will require two SCUBA-certified divers in recumbent position, facing front or back, but only the forward-facing diver will steer. Their feet will meet in the middle of the sub to pedal a tandem bicycle setup with a figure-8 chain. The power will be routed out to the stern with a flexible shaft.

Independent breathing systems provide each diver with his own 80 cubic foot tank of air, plus an emergency "Spare-Air" tank for 30 additional breaths. Nevertheless, four-foot long hatches "provide more than ample space for entry and egress." Hatches allow water and air to enter through the air vents, which double as handles for easy emergency removal.

Construction of the new submarine includes the all-important fundraising process. *Atlas* was funded with over \$50,000 in cash and in-kind donations. Team members are hoping to raise another \$50,000 for the new model; and encourage prospective sponsors and supporters to contact them via email at [hps@umich.edu](mailto:hps@umich.edu).

Captain Tilchen's commitment to the team's challenge includes 20 hours a week of volunteer work, the most that he will permit from the 25 active members of the team, who are students ranging from freshmen to PhD candidates from almost every department at the college. The Department of Naval Architecture and Marine Engineering is the team's home department.

For up-to-date information on the Human Powered Submarine Team, visit their Web site at <http://www.yellowsclub.com>. **MT**

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## Michigan Today

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Michigan Today is published three times a year by News and Information Services, The University of Michigan, 412 Maynard Street, Ann Arbor MI 48109-1399  
Telephone: (734) 764-0105  
Fax: (734) 764-7084  
E-mail: [Johnwood@umich.edu](mailto:Johnwood@umich.edu)  
Online edition: <http://www.umich.edu/~newsinfo/>  
Circulation: 388,000

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