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A Moran Plan

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FULL STORY ▶

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Wall Street Education The humming of an airplane laboring to reach maximum altitude has lulled senior finance major James Keller to sleep. But in less than two hours the Seattle native will be wide awake presenting an assessment of a wireless phone service company to a top Wall Street analyst.

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Surface Deep Surface area is to porous ceramics what mojo is to blues singers – a crucial commodity, the more plentiful the better. Chris Landry, associate professor of chemistry, is putting this mojo to work in the worldwide fight against chemical weapons.

THE WEEK IN VIEW

April 30 **5:30 p.m. Ceremony: "Women of the Year," with guest speaker former Vermont Gov. Madeleine Kunin. Event celebrates campus women. Billings Student Center North Lounge. Information: 656-7892**

May 1 **4 p.m. Seminar: "Proteolytic Regulation of Signaling Through the Notch Receptor," with Matthew Rand, research assistant professor of anatomy and neurobiology. B-333 Given**

May 3 **5 p.m. CALS Alumni dinner and awards. Clarion Hotel, South Burlington. Tickets $35. Information: 656-0321**

May 6 **12 p.m. Seminar: "Exploring the Roles of cGMP and cGMP-dependent Protein Kinase in Intracellular Signaling," with Wolfgang Dostmann, assistant professor of pharmacology. 101 Stafford.**

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NEWS BRIEFS

Atka, a one year-old full-blooded wolf, climbs on a desk at Waterman during a lecture by Henry Fair of the Wolf Conservation Center. *(Photo: Jon Reidel)*

Waterman Wolf Shows Crowd Gentler Side

The New York-based Wolf Conservation Center is based on the idea that personal acquaintance of people with wolves builds a bridge of understanding and concern for wolves in the wild.

Wolf Conservation Center Director Henry Fair says one of the main objectives of his organization is to dispel the erroneous stereotypes and myths that plague wolves, and are perpetuated by stories like "The Big Bad Wolf" and "Little Red Riding Hood."

"What better way to demystify the wolf than for people to experience them face to face?" Fair says.

Fair's traveling demystification show came to UVM on April 25 when he brought a full-blooded wolf to Waterman for one of his lectures, a talk sponsored by the Environmental Studies program. Atka, a domesticated white wolf, commanded the crowd's attention not for her fierceness, but rather for her gentle playfulness.

Although Fair insisted on audience members not petting the wolf, saying they're not meant to be pets, most onlookers got within a few feet of Apache, whose antics included climbing on a desk, playfully shredding a stack of papers, and gently nudging some onlookers.

About 50 people attended the lecture to listen to Fair and William S. Lynn, research scholar and executive director of the Center for Humans and Nature, an independent nonprofit working on the mutual well-being of human communities and the

Discover Magazine says UVM Chemist's Drug May Bring An "End to Craving" for Addicts

Martin Kuehne, emeritus professor of chemistry, honed his skills synthesizing complex alkaloids for decades, work that culminated with his team winning a world-wide race to create better versions of vinblastine and vincristine, compounds that attack leukemia.

That effort, which concluded in the late 1980's, could have been a coda to a successful career. But as that drive ended, Kuehne became interested in another alkaloid, ibogaine, an unpredictable and dangerous derivative of an African bush that seemed to have powerful anti-addictive properties – and a range of dismal side-effects ranging from hallucinations to whole-body tremors.

"We had succeeded nicely with the very challenging vincristine problem, and in the process we leaned a lot of chemistry which could be applied to ibogaine," Kuehne says from his third-floor Cook office.

After several years of work, Kuehne synthesized the compound in the late 1980's and, through a process of molecular stress-testing, his team drew on the alkaloid literature to make a number of variations of ibogaine that might have the original compound's anti-addictive powers without the unwanted effects.

Kuehne then approached Stanley Glick, an expert in anti-addiction pharmacology at Albany Medical College, to begin testing the compounds on rats. In the 13 odd years since, one of Kuehne's variants, 18-methoxycoronaridine (18-MC for short), has shown a remarkable ability in Glick and others' lab experiments to drastically and immediately reduce rats' cravings for opiates, cocaine, nicotine and methamphetamine. It also reduces withdrawal symptoms when they stop using the drugs, and it does this without causing tremors and other dramatic side-effects.

The substance has never been tested on humans – though a venture capital group is now trying to raise money for a trial involving clinicians at Columbia and New York University – but it nevertheless was the primary subject matter for a May story in *Discover* magazine, which billed it as "the end of craving."

Kuehne says a single dose of the drug, in many cases, is enough to break the addictive spiral in animals. The compound's pharmacological effects are still being explored, but it seems to have little direct effect on dopamine, a brain chemical

natural world, primarily through research, education and outreach.

Fair said the Wolf Conservation Center has four main goals: To promote wolf conservation through education; support reintroduction into federally designated areas that can sustain viable wolf populations; provide a natural habitat sanctuary for a few captive wolves where observation of natural behavior is possible; and to prove that wolves in the wild are not dangerous to people.

Faculty Win Service-Learning Grants

Five UVM faculty – Eileen Burgin, Susan Comerford, Anne Greenan-Naumann, Tom Hudspeth and Alan McIntosh – have won mini-grants to incorporate service learning in their fall classes.

This will allow their students to gain practical experience in areas such as political processes during elections, developing a book for educators about sustainable environmental development and initiating a long-term physical therapy outreach program. Community nonprofits and educational institutions will, in turn, gain important resources through students' work.

All of the grant winners participated in the Faculty Fellows for Service-Learning program, where they explored the academic benefits of service-learning and developed materials for implementation in their courses. During this time, they also formed relationships with community partners with whom they will work.

The program is made possible by the Fund for the Improvement of Post-Secondary Education and the Vermont Campus Compact. At UVM, these efforts are administrated by the Community Outreach Partnership Center. For more information about service learning on this campus, contact Courtney Lamontagne at 656-0095.

Locker Leases End May 9

Patrick Gymnasium locker leases expire on May 9 – if you have one, you must either renew your term or turn in your lock and towel before that date.

The cost remains $10 per semester or $30 for 12 months starting this summer

Renewals are available at the varsity equipment office, which is room B13 within the gym. The office accepts cash, checks and CatScratch. For more information, contact Michael Walston at 656-7679.

targeted by most other anti-addiction drugs. Instead, Glick's research shows that 18-MC operates on an entirely different pathway, the habenulo-interpeduncular, one little investigated by pharmacologists working on chemical answers to addictions. The compound's action is highly specific; unlike ibogaine, which blocks the action of multiple brain receptors, MC-18 targets only one crucial neuron, which contributes to its relatively few side effects.

So is 18-MC potentially, as *Discover* speculated, a miracle drug for addicts?

Kuehne has no idea, but he's optimistic. If the expensive and intricate process of getting a clinical trial off the ground succeeds, he thinks there is "good reason" to believe it would succeed. But the road has been long and difficult, and Kuehne is painfully aware of the hundreds of potential financial, regulatory and scientific problems that can stop a promising compound from becoming a marketable drug. UVM's patent on his vinblastine/vincristine variants, work that was at once fantastically difficult and highly successful in the lab, has not proven commercially viable.

But he is hopeful about 18-MC's potential, and he is coming to work every day, despite retirement.

"I'm still here working, because I really want to see this come to fruition," he says. "I have thought for many years that this would be beneficial to mankind."

Click here to Read the Discover Story. Please note that this link is to a site outside the University of Vermont, and may eventually expire.

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EVENTS

Fleming on "Art Express"

The Fleming-fueled spate of Andymania is winding down, but not, as yet, out: Museum director Janie Cohen will take viewers on a tour of the Warhol show for the PBS program "Art Express."

The segment may well include snippets of Lou Reed's Ira Allen Chapel concert, as well as critical insight from Cohen and Middlebury College professor John Hunisack. The show airs on April 30 at 8 p.m. on Mountain Lake PBS. It encores on Friday, May 2 at 9:30 p.m. and Sunday, May 25 at 3 p.m.

The Fleming exhibit, "Andy Warhol: Work and Play," closes June 8.

Singing Seniors

The Top Cats, maestros of melliflousness in an a capella vein, will present their annual "Senior Show" on May 3 at 8 p.m. in Ira Allen Chapel.

The night of music will feature the group's departing seniors. Tickets are $5 at the door.

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April 30 - May 13, 2003

Publications and Presentations

John Gennari, assistant professor of English and ALANA U.S. Ethnic Studies, will deliver a paper titled "Freedom Now: The Jazz Avant-Garde, The 1960s Black Freedom Struggle, and U.S. Jazz Criticism," at the Culture and the State conference in Edmonton, Alberta on May 3. On April 12, he delivered a paper titled "What is Jazz? The Case of George Wein" at the Second Annual Pop Conference at the Experience Music Project museum in Seattle. In June, he will deliver the keynote address at an international scholar's symposium to be held in conjunction with the Terni Jazz Festival in Terni (Umbria), Italy.

Thomas Streeter, associate professor of sociology, delivered a response to Nielsen CEO Susan Whiting's presentation at a MIT Communications Forum. The event was titled "What's happening to the TV audience?" Event audio is available here: MIT Communications Forum.

Awards and Honors

Lynne Bond, professor of psychology, was selected as one of 15 national finalists for the Ninth Annual Campus Compact Thomas Ehrlich Faculty Award for Service Learning. More than 140 others were nominated in an extremely competitive pool. The two winners were from Vanderbilt and the University of Massachusetts, Boston.

Committees in the U.S. Congress, a book written by **Garrison Nelson**, professor of political science, was named a best reference source for 2002 by *Library Journal*.

April 23 - April 29, 2003

Awards and Honors

David Warshaw, chair and professor of molecular physiology and biophysics, was appointed to the Biophysical Society's membership committee at the organization's 47th annual meeting in San Antonio, Texas, in March. Founded in 1956, the society is a professional group established to encourage development and dissemination of knowledge in biophysics.

Dr. Stephen Leffler, associate professor of surgery, and **Dr. Mark Levine**, associate professor of medicine, were recently elected to membership in the UVM chapter of the Alpha Omega Alpha Honor Medical Society. The following members of the College of Medicine's Class of 2004 were also recently elected to Alpha Omega Alpha: **Susan Campbell, Carolyn Come, Kerry Sibert** and **Lavone Simmons**. The AOA faculty councillor for the UVM chapter of Alpha Omega Alpha is Dr. William Raszka, associate professor of pediatrics.

Students from the 2+2 Program in Dairy Farm Management (FARMS) took high honors at the North American Intercollegiate Dairy Challenge on April 11-12 at Michigan State University. UVM upperclassmen earned third place, and Vermont Technical College second-year students took second place (the VTC students will spend their final two years at UVM as part of the program). The contest, organized and sponsored by companies from the dairy industry, challenged students to analyze an actual farm business and its management records. **Wanda Emerich**, of New York's W.H. Miner Agricultural Research Institute, and **Don Maynard**, lecturer of animal sciences, coached UVM students **Jeff Sheldon, Sean Hardy, Keely McGarr, Rachel Pucetti** and **Liz Brunst**.

A Moran Plan

By Kevin Foley

Eyesore or asset? Under the direction of Professor John Todd, UVM students have created a comprehensive vision of the abandoned waterfront power station as ecological showpiece.

The Moran building, a defunct and dilapidated coal-fired power plant decorating a prime swath of Burlington waterfront with all the beauty of a prizefighter's elaborately broken nose, is a persistent problem for city officials.

But for students in John Todd's ecological design studio, it's a potential haven offering an opportunity to unify the community, clean lake water and push the limits of ecologically conscious redevelopment.

The studio course is the conclusion of a two-semester sequence that first introduces students to the concepts of ecological design – Todd's term for the science and practice of finding sustainable ways to address energy, architecture, food production, waste transformation and environmental stewardship – then sets them loose to use what they learned on a problem of public importance.

"This process has influence," says Todd. "In the early years of the class, we worked on proposals for an industrial eco-park in the Intervale, something that will start becoming a reality in about one month."

In other years, students have argued for renovating UVM's Hills Building into an ecological design showpiece and created proposals for greener and more expansive university student housing. Some of the student ideas have found some traction among planners and architects, others have not, but the goal of class, Todd says, is always to "produce a product others can use."

In an April 29 presentation, students spent more than 90 minutes outlining their vision for the plant to an audience of local planners, architects and stakeholders in the building. Their proposed set of alternatives leverages the Moran's unique architectural features and location near the center of the Burlington bike path to create an ecological showpiece and community center that would, the students say, bring the city's disparate neighborhoods together.

"Our goal as a class was to present a collective vision," says senior Mikal Burley, "a demonstration of sustainable development."

Location, location, location

Creating that collective vision required the students to break into small working groups targeting particular areas of the rehabilitation. One team researched the building's energy needs, others investigated the possibility of using the building's sunny south-facing "steps" to create greenhouses for a waterfront restaurant or community kitchen. Others did feasibility work on roof gardens, a basement artificial kelp forest that would purify lake water using the building's

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There's a sign on the wall at Montreal's Botanical Gardens that reads "*ne touchez pas*." Adjunct professor Kit Anderson laughs to herself each time she sees it.

Surface Deep

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existing system of basement sluices.

The theme was to work with the building's problematic architecture, which thus far has rendered it impervious to redevelopment despite its prime location, rather than try to eliminate it.

"Some of the students caught fire to the idea that this building is a sitting gold mine," says graduate student Mark Keffer, the course's teaching assistant. "And it's not just this building, it's hundreds of buildings across the state and nation. The idea that really captivated students was that a building could be redesigned to give back to the environment, not just the biological environment, but the social and community environment as well."

The cost of mining that "gold," while probably less than tearing down and rebuilding, is not cheap. Student estimate for a green roof pushed $1 million, with millions more in other proposals for photovoltaic panels, special trombe wall insulation and other projects. The class argues that the investment would respect Burlington's industrial past while looking to the city's green future, and pay huge dividends in inspiration.

Not all of the student proposals were pricy. Their research led them to argue for effective, inexpensive methods to start remediating the property's environmental problems. A poplar grove in the coal- and oil-stained "black soil" surrounding the Moran, the group proposes, may be able to naturally clean much of the tainted earth.

As the sprawling presentation unfolded, expert observers in the audience chimed in on aspects of the proposal good and bad. An idea for developing a bicycle rickshaw service "had been tried before – and didn't work," said a local planner.

Moran momentum?

The student presenters, fortified by months of internal debate and research, were undeterred by such skeptical feedback. Their answers took the site's negatives into account – then focused relentlessly on the possible, rather than just the merely probable.

Austin Troy, an assistant professor of natural resources and member of the Burlington Planning Commission, watched the presentation with three of his colleagues from the commission. He personally felt that the students' work made a real contribution to Burlington's ongoing conversation about the Moran's fate.

"The question is always where the money is going to come from," he says. "But what they've done is great: They've given out some information on green technologies that might apply to the site given its unique location and factors. They've given the city a lot of material to work with.

"If they want to pursue this, they need to talk with decision-makers and get the word out," he continues. "Students have had influence in getting the new Intervale center to become reality and there's reason to believe that the same thing could eventually happen with the Moran."

That's exactly what Keffer, and some of the non-graduating students who worked on the project, hope to do. And he's optimistic about their potential for success.

"Ecological renovation is becoming more and more relevant all over the world. The momentum is at a point, and Burlington is progressive enough, for these two things to mesh and make a project like this happen," he says. "We have waterfront, an industrial past, and a lot of green thinkers. Will something like this happen here in the next ten years? I would be surprised if it didn't, either at the Moran or elsewhere."

Mark Keffer invites dialogue about the course and the Moran, and is happy to share presentation materials. His e-mail is jkeffer@uvm.edu.

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Wall Street Education

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By Jon Reidel

Members of the Wall Street Honors Seminar take a break for lunch at a Manhattan eatery after giving an analysis of a telecom company to UVM alum Dave Daigle '89, chief analyst and investment officer of high yield bonds at The Capital Group. *(Photo: Jon Reidel)*

The humming of an airplane laboring to reach maximum altitude has lulled senior finance major James Keller to sleep. It's April 24, and the Seattle native is on his way to New York with four other UVM students to present an assessment of a digital wireless phone service company to a seasoned Wall Street analyst.

Less than two hours and a $40 cab ride later, Keller is wide awake standing in the corporate offices of the world's third-largest equity management company in the heart of Midtown Manhattan, fielding questions from one of the top telecom analysts in the country.

Welcome to the real world

UVM alumnus David Daigle '89, chief analyst and investment officer of high yield bonds at The Capital Group, wants to know why Keller thinks that banks wouldn't want to renegotiate the terms of their contract with Triton PCS Holdings Inc. to help them deal with their outstanding credit issues.

Silence fills the elaborately decorated boardroom as Keller, sitting across from Daigle at a 25-foot long wooden conference table in a scene reminiscent of "Wall Street," searches for an appropriate response. After what seems like an hour, Keller answers Daigle, who in turn begins steering Keller in a specific direction, as opposed to lecturing him.

After some lengthy discussion, Keller, who appears confident throughout, thanks Daigle for helping him reach a conclusion, and passes the presentation duties on to his classmate, Rachel Falwell.

Daigle is just warming up. He engages Falwell in a similar discussion about her analysis of Triton's industry position and the potential threats facing the wireless provider of 13.6 million people. They too reach a conclusion.

Just prior to the start of the presentation, Daigle had asked his former mentor and UVM professor James Gatti, who is the organizer of the Wall Street Honors Seminar, if it's OK if he intervenes periodically with questions. Gatti, who considers Daigle one of the finest students he's ever taught in his more than 30 years at UVM, says, "By all means."

Daigle, a native of Westfield, Vermont and the first in his family to attend college, has a knack for making the students look at things from the perspective of someone like himself, who helps generate good investment ideas for a company that oversees more than $300 billion in assets.

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Alexa Swainson, a tall, confident blonde-haired engineering major with a concentration in finance, is Daigle's next pupil. Swainson, who spent much of her youth just outside New York, appears comfortable in the corporate setting. She more than holds her own with Daigle, who continues to act more as educator than heavy-handed business exec.

Finally, some two hours into the presentation, there's a break in the action. Daigle has to make a phone call and will be back in five minutes. As he closes the boardroom door behind him, there's a collective sigh of relief when Gatti says, "Wow, this is considerably more intense than our other trips."

An honors education

Senior finance major Chris Petrone of Connecticut says he thinks he just learned more in the past two hours than they did all semester. "The level of thinking is incredible," he says. "This is one of the most interesting things I've ever done."

Gatti had taken the same five students to New York in March to present their assessment of AT&T Wireless bonds to a group of analysts at Morgan Stanley. UVM alum Steve Penwell '84, a managing director at Morgan Stanley, took the group out to lunch at the Palm restaurant, which was preceded by a tour of the bond trading floor courtesy of alum Taylor Watts '01, also of Morgan Stanley.

Although the students agreed that both trips were valuable in their own ways, Daigle's line of questioning was at a level they'd never experienced. He occasionally used a piece of paper and a calculator to show students how he arrived at a conclusion on the fly.

When Daigle re-enters the room, the intellectual dance begins again. He probes the students for answers regarding how they came to certain resolutions. Finally, more than three hours later, it's over. Daigle thanks everyone for coming, shakes hands and leaves the room.

"My interview shouldn't be too difficult after that," jokes Keller, who, along with classmate Curt Dwyer, has an interview two hours later at an investment firm down the street from Daigle's office.

"It shouldn't be intimidating presenting to clients at IBM after going through that," says Swainson, who is the only one with a job waiting for her when she graduates, although all of the students have interviews lined up. "He was very much guiding us through it all. It was tough, but rewarding. That's what you're going to get in the real world."

After a pricey lunch, the group split up with Dwyer and Keller heading to their interviews and the others to the site of the Sept. 11, 2001 World Trade Center attack.

Later in the day, the students meet back at LaGuardia to fly home. UVM President Daniel Mark Fogel is on the same plane returning from a business trip, and on the return trip he and student Alex Swainson discuss UVM, with Fogel asking Swainson's opinion on a number of business-related questions pertaining to the university. Swainson appears completely comfortable in Fogel's presence, fielding his questions with the poise of a seasoned business exec.

As Fogel walks off the plane and into the airport lobby, someone asks him about his conversation with the soon-to-be-graduate, and the president replies with a grin, "I think she's going to be just fine."

The Land as Classroom

By Jon Reidel

Kit Anderson says teaching outside works because "we learn through all our senses." *(Photo: Bill DiLillo)*

There's a sign on the wall at Montreal's Botanical Gardens that reads "*ne touchez pas*." Adjunct professor Kit Anderson quietly laughs to herself each time she sees it because she knows the students in her tropical botany class won't be able to completely abide by it – just as she couldn't as an undergraduate in the 1970s.

"I see that sign every time we go up there," says Anderson. "But I know there's no stopping them. The touches and the smells – that's what sticks with them."

It's these kinds of out-of-classroom experiences that Anderson and a number of other university professors believe is crucial to the education of their students. The outdoors classroom is the only place that some courses can be effectively taught, they argue.

Anderson, who is in the process of moving all her classes outside, says it would be impossible to teach her full slate of summer courses, which include outdoor favorites, "Introduction to Ethno Botany," "Non-Timber Forest Products in the Northeast" and "Ethno Botany of New England" in the confines of a building.

"I'm fully convinced that the best learning takes place outside," says Anderson. "We learn through all our senses. If learning is going to have an impact, students have to be engaged in some way. When you smell something and touch it, it goes into people because of that interaction. If you're in a classroom, it's just words."

Field notes
Rick Paradis, longtime lecturer in the Environmental Program and manager of the UVM Natural Area System, is also a firm believer in the power of the outdoor classroom. He co-teaches a summer course with Assistant Anthropology Professor Luis Vivanco titled "Field Methods in Environmental Research," which takes students to places ranging from downtown Burlington to Centennial Woods and Mount Mansfield.

Paradis says he remembers taking classes as an undergraduate that included a field component, and that they had a profound effect on him. He feels certain that holding classes outdoors has been a positive experience for his students as well.

On a recent trip to Mount Mansfield with one of his classes, Paradis ran into a former student at the same place he'd taken her years earlier as part of a class. The student thanked him for introducing her to the spot – and to the field of alpine ecology and restoration in which she is now employed.

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"It was a setting like that that she remembered," says Paradis. "There's nothing like getting out in the field and learning. There's a connection outside – something that's difficult to get across in the confines of a classroom. Add that component to an educational experience, and you can come up with something potentially very powerful."

Many of the courses taught outside take students to places far beyond the confines of the Green Mountain State. This summer, for example, as many as a half-dozen courses require travel to foreign countries such as Costa Rica and Scotland. Assistant Professor Saleem Ali and Paradis are taking students to Scotland to co-teach: "Resource Conservation in Northern European Ecosystems: The Mountains and Minerals of Scotland." Last winter, an ecology course taught in the Maine woods by Bernd Heinrich, professor of biology, was written up in the *New York Times*.

Outdoor engagment

Many courses not related to the environment are also held outside. Some art, poetry and philosophy classes have outdoor components – or perhaps just instructors who want to bask in the spring sunshine for a while as they go over the same material they wood have indoors. That's fine, says Anderson, even as she points out that pedagogy al fresco has some perils.

"Clearly not all classes should be held outside," she says. "Everyone's attention isn't always there when you need it, so closed spaces are better in some cases."

Senior Mervyn Crawford has taken a number of outdoor classes during his four years at UVM, which he says greatly enhanced his overall college experience.

"We went outside every day for one class," says Crawford. "You couldn't get the scope of the environment that was needed without being in that setting to fully understand its implications. Being outside really helps you understand the material – it gets embedded in your person."

theview

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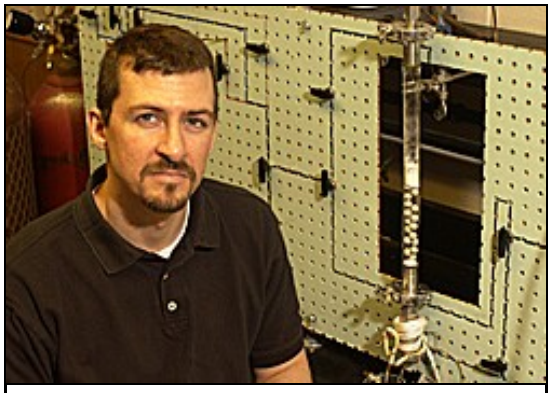
Surface Deep

UVM chemist is building super ceramic materials to safely neutralize chemical weapons

By Kevin Foley



Chris Landry is using defense funding to engineer a clean way of neutralizing chemical weapons. *(Photo: Bill DiLillo)*

?E{ ?p s ceramics what mojo is to blues singers – a crucial commodity, the more plentiful the better. Chris Landry, associate professor of chemistry, is putting this mojo to work in the worldwide fight against chemical weapons: He's developing ceramic materials that can easily and safely neutralize mustard gas stockpiles.

"There are huge existing stores of chemical weapons throughout the world. It poses environmental challenges, even a risk of terrorism. We have to get rid of this stuff," Landry says.

The conventional method for disposing of unconventional materials is incineration. But even the best disposal furnaces leak traces of the chemicals into the environment. For mustard gas, this probably isn't dangerous; but nerve gas is harmful at miniscule parts-per-billion concentrations. Burning weapons also produces nasty atmosphere-thickening greenhouse gases.

And if that weren't enough, there's another problem: No one wants to live in a townhouse anywhere remotely close to a chemical weapons barbecue.

A better approach?

One possible answer, Landry thinks, lies in a deceptively humble pegboard and beaker concoction in his first-floor Cook laboratory.

The machine lets Landry and his team bubble "half-mustard" (a variant of mustard gas that "tastes" compositionally similar, but is less killing) into a tube with ceramic pellets made in the laboratory. Adding a metal catalyst swiftly breaks down the active ingredients of harmless half-mustard (and, presumably, those of dangerous real mustard gas) into benign byproduct chemicals found naturally. A production model of the equipment, Landry says, could be small and simple enough for soldiers to use in the field.

In Landry's laboratory, byproducts of the reaction are shunted into a gas chromatograph that analyzes the components of the gas and typically determines that the reaction consumes about 99 percent of half-mustard's active ingredients in lab conditions. The exhaust is then grabbed safely by the lab's fume hood.

Three years into the research and with the process working beautifully with the ersatz chemical, Landry is hoping in the near future to put his ceramics – and his recent additional grant of $500,000 in funding from the Department of Defense – to work in neutralizing the real thing.

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Moran Plan

The Moran building, a defunct and dilapidated coal-fired power plant decorating a prime swath of Burlington waterfront with all the beauty of a prizefighter's elaborately broken nose, is a persistent problem for city officials. But for students in John Todd's ecological design studio, it's a site for ecological dreams.

Wall Street Education

The humming of an airplane laboring to reach maximum altitude has lulled senior finance major James Keller to sleep. But in less than two hours the Seattle native will be wide awake presenting an assessment of a wireless phone service company to a top Wall Street analyst.

Teaching Outside

There's a sign on the wall at Montreal's Botanical Gardens that reads "*ne touchez pas*." Adjunct professor Kit Anderson laughs to herself each time she sees it.

"It's tremendously exciting," Landry says. "We're at the point now where we're working to convince a government lab to try the process with real mustard gas so we can test effectiveness under controlled, safe conditions."

Ceramic superstars

Mustard gas isn't the only potential target for Landry's specially tailored ceramic super-surfaces. Other chemical weapons substances may prove amenable to variations of the basic neutralization approach. Perhaps at some point in the future, the ceramics may prove to be an effective and economical way to reduce greenhouse gases produced by industry.

"This kind of process is in industrial use right now scrubbing the exhaust from coal plants. That's where we borrowed the idea," Landry says. "But the industrial scrubbers are not nearly as effective as what we're working with here."

Other threads of Landry's research, which involves a team of four graduate students and an undergraduate, involve investigating the appropriateness of the materials for use in chromatography, which might allow for the incredibly fine separations of desired chemicals necessary in pharmaceutical development. Another strand looks at using the materials for delivering certain drugs more effectively and precisely.

"The key is the extremely high surface area of the materials we work with," Landry says. "A gram of rock you pull out of the ground might have 30 meters-squared of surface area. The stuff from our lab has 11,000 meters-squared per gram. It gives you that much more surface that you can use."

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