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# ON For UW-Madison Alumni and Friends WISCONSIN

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## Research

### Happy Days Survey in Reruns

Richie Cunningham had a midlife crisis. Ralph Malph ended up as an investment banker. The Fonz is worried about retirement, but he's looking forward to spending less time at the office and more time teaching his grandkids how to ride a Harley.

It's hard to imagine such possibilities for the boys of Happy Days, frozen as they are in the perpetuity of television fantasy. But for Wisconsin's real Class of 1957, life has rolled on. And thanks to a monumental research project begun at UW-Madison more than forty years ago, researchers have a pretty good idea of what those lives have been like.

The Wisconsin Longitudinal Study (WLS) began surveying the Happy Days cohort — so named because it includes all Wisconsin high school graduates from 1957, the same year as the show's characters — a few years after graduation. Since then, researchers have checked in with the class as it ages. Another round of interviews begins this summer, adding a much-anticipated new chapter to a living document that influences academic research and public policy.

"In social science, there are just a few common bodies of data that everyone goes to," says **Robert Hauser**, a professor of sociology and current director of the WLS. "Ours is one of those kinds of studies that will be valuable for decades after we're done, in ways we can't imagine now."



Wisconsin's study wasn't designed to become a lifetime pursuit. It began as a one-shot survey of the postschool aspirations of the state's graduating seniors. Those 33,000 responses sat in a basement for years, until legendary sociology professor **William Sewell**, who had been researching issues of young adulthood, decided to follow up with about ten thousand of the respondents. Additional surveys were done in 1975 and 1992.

It's no small affair to track people's lives over that many years. The new wave will involve some 26,000 phone interviews and 15,000 more by mail. Because few sources are as thorough, social scientists eagerly anticipate each new round. More than 180 academic papers have been written using its data, and governmental agencies such as the National Institute on Aging, the survey's main sponsor, pay close attention to its findings.

As the Happy Days gang pushes sixty-five, the survey has begun to focus on successful transitions into senior citizenship, Hauser says. The new questionnaire, which took a year to design and involved more than fifty faculty and staff, delves into issues such as age-related health problems, economic and social well-being, intergenerational relationships, and how couples decide to end their careers. Hauser says that information will be especially useful when matched against respondents' prior answers and life experiences. "After all," he says, "aging begins at birth."

— Michael Penn

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### COOL TOOL — The Wizards of Oz Pack

Book bags have grown so roomy in recent years that some students look as if they're preparing to trek the Himalayas. But SUV-sized backpacks don't suit engineering student **Osman Ozcanli**, a native of Turkey. "Turkish students are practical," he says. "They only carry what is necessary." So Ozcanli came up with something more — or rather, less. As an assignment for a business course, he and **Anand Chhatpar** invented a slimmer, binder-style case that Ozcanli calls the "Oz Pack." More like a file than a pack, it comfortably carts a few books or notepads. A prototype of the Oz Pack won a campus competition for new inventions, which convinced Ozcanli to start manufacturing the packs. He and a high school friend arranged to market the packs through several schools in Turkey, where Ozcanli says they're selling well. That led to a deal with the University Book Store, which has sold more than a dozen Oz Packs since April. Meanwhile,



*Ozcanli, left, and Chhatpar take a load off at Library mall.*

Ozcanli, who is interviewing for sales jobs, is sketching out designs for wallets, pencil cases, and laptop carryalls.

— M.P.

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Will a tapeworm a day keep the doctor away? Probably not, but scientists at UW-Madison recently discovered that tapeworms can give a boost to medicine. A chemical they produce helps drugs become absorbed more effectively into the bloodstream.

**John Oaks**, professor at the School of Veterinary Medicine, and **Paul Bass**, emeritus professor at the School of Pharmacy, worked together to identify a chemical signal molecule, known as cGMP, which tapeworms emit to slow small intestinal movement in their animal hosts. The same action that helps a tapeworm thrive in the gut of its host may also boost the effectiveness of drugs. Scientists are testing the compound as an additive to medicine, hoping to use the tapeworm's tactics to increase drug absorption by prolonging passage through the intestines.



*Tapeworms may not look pretty, but they do make the most of their environment.*

"We never would have made this breakthrough without our partnership," says Bass. "One of the greatest things about UW-Madison is the outstanding collaboration between departments."

The use of cGMP in medicines has been patented by the Wisconsin Alumni Research Foundation, and scientists are testing the additive with a blood pressure medication with a 50 percent absorption rate. With the rising cost of prescription drugs, the implications for consumers could be huge.

"Both humans and animals could take lower doses, decreasing the cost and side effects of prescriptions," says Oaks. "And because the medicine would be better absorbed, less of it would end up in the environment."

— Erin Hueffner '00

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Because southern California records thirty tremors a day, earthquakes are as much a part of

daily life as eating and sleeping. And though a majority of seismic activity goes undetected, Californians understand that the next one could be the Big One.

Thanks to the efforts of UW-Madison seismologist **Richard Allen**, an early-warning system may soon be available. For two years, Allen has been working with TriNet, a California-based seismic network, on techniques to rapidly detect the initiation of a quake, determine its size and location, and predict peak ground motion. This work has led to an idea called ElarmS, short for Earthquake Alarm Systems.

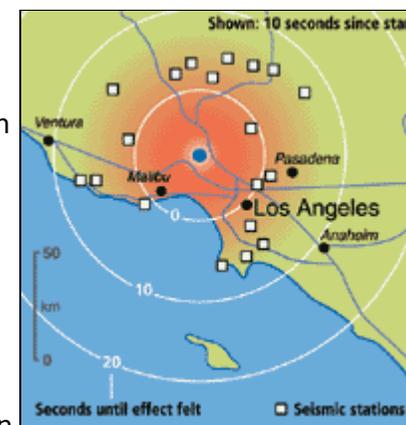
The alert system would signal a quake one to twenty seconds before its effects are felt in surrounding communities. While that may not sound like much time, even a few seconds could be invaluable to those living in heavily populated areas along the San Andreas fault.

"If you're near the epicenter of an earthquake, a one- to two-second warning is enough to crawl under a desk or table," says Allen. "For those living up to sixty kilometers away, a twenty-second warning may be enough time to evacuate a building."

The ElarmS prototype, currently in the testing phase, uses the Internet to send real-time messages to those who live and work in regions with a high incidence of activity. While the system is designed to work for earthquakes that register greater than three on the Richter scale, Allen and his team are focusing on warnings for those at five or above - the ones that shake shelves and cause serious structural damage.

"A severe earthquake takes place about once every ten years in California," says Allen. "We're hoping to complete our research before the next big one occurs, joining Mexico, Taiwan, and Japan in a global effort to reduce damage by earthquakes."

— Christine Lampe '92



### Kills Rats ... and Dictators?

When UW biochemist **Karl Paul Link '22, MS'23, PhD'25** discovered the blood thinner dicumerol in 1933, he stumbled onto a wonder drug that helps prevent strokes, and, as the basis for Warfarin, is a wickedly effective rat poison. But could Link's discovery also have helped rid

the world of a ruthless dictator?

According to *Stalin's Last Crime*, a recent book by Russian historian Vladimir Naumov and Yale professor Jonathan Brent, Warfarin may have killed Soviet leader Josef Stalin. Brent, who has reviewed previously secret reports, says that doctors on the scene reported the possibility that Stalin did not suffer a brain hemorrhage, as historians have long believed, but rather was poisoned. A neurosurgeon and a cardiologist "both said the same thing," he says. "They said the cause of death was either cerebral hemorrhage or Warfarin poisoning." He hopes his book will lead to a new autopsy for Stalin.

— John Allen

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### Wisconsin Ideas

Scientists have found a second doorway that anthrax toxins use to get into cells, moving the researchers one step closer to **protecting people from anthrax exposure**. The new findings — from the same team that in 2001 identified the first receptors that allow anthrax toxins into human cells — provide more information for researchers who are trying to devise a way to block the toxins' path into the cells of the body, where they can trigger devastating effects.

One of the victims of the aging process seems to be the **sense of smell**, according to a new study from the UW's Department of Population Health Sciences. Researchers found that the percentage of people with olfactory impairment increases steadily with age. More than 60 percent of those age eighty or above had impaired ability to smell. The authors don't know why the connection exists, but they say it underlines the need for smoke and gas detectors in the homes of seniors.

Researchers have devised a type of diamond film that may eventually make possible a new breed of **effective biosensors**. Engineers have been trying for some time to devise inexpensive, compact sensors that can sniff out biological agents in the air around battlefields or public spaces such as airports and subways. The challenge is finding materials stable enough to work continuously — to keep sniffing over long periods of time. A team of UW chemists and engineers may have found that elusive surface by modifying diamond with genetic material, which changes when certain biological agents are in the air.

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### Stemming Parkinson's

Serendipity has plenty to do with the progress of science. It was mere chance, for instance, that found **Clive Svendsen** and Steven Gill in the same British pub a few years ago. But that encounter ultimately may lead to a new treatment



*After having been "swept away by the stem cell river," Svendsen's new work is a return to neurobiology — with a stem cell twist.*

for Parkinson's disease, a chronic illness that has long vexed scientists.

In Parkinson's patients, large numbers of cells in the brain inexplicably die, leaving the brain critically low on dopamine, a lubricant that helps nerves communicate. Without dopamine, Parkinson's patients lose command of their muscles, often shaking or rocking uncontrollably. Some drugs help make up for the lost dopamine, but they tend to lose effectiveness over time.

At UW-Madison, Parkinson's has been one of the first targets for stem cell scientists, who have been working to restore or replace the lost dopamine-producing cells. As a result of his chance meeting, Svendsen, a neuroscientist with the Waisman Center who has been studying neural stem cells, is now following what appears to be a promising sidetrack, employing a natural growth factor to help keep a patient's own cells healthy.

Svendsen met Gill, a surgeon at the Institute of Neurosciences in Bristol, England, after giving a talk on the as-yet-unfulfilled promise of stem cell therapies. "He wanted to start using stem cells in his patients," Svendsen says. "I had to tell him that I didn't have any yet."

Instead, the researchers hashed out an alternative approach using a growth factor known as GDNF, which scientists have long believed could help treat Parkinson's, despite disappointing results in trials. One of the key proteins involved in the early development of the brain, GDNF acts sort of like a fertilizer, helping brain cells grow and thrive. In animal models, wilting brain cells respond to GDNF like plants that have been watered. "Once you feed those cells GDNF, they just seem to come back to life," Svendsen says.

Gill performed surgeries on five patients with advanced Parkinson's, implanting in each patient's

chest two pumps that store and feed GDNF directly into the brain. The small trial was done primarily to prove the procedure could be done safely, but Svendsen says the patients have shown dramatic progress. After eighteen months, all had regained significant control of motor functions and showed no ill effects from the treatment.

Svendsen's first love was studying the biology of the brain, but at the UW he became "swept away by the stem cell river." The next phases of research, however, lead directly back to the promising cells, which may eventually replace the cumbersome pumps.

In the lab, Svendsen has been able to train stem cells derived from fetal tissue to produce steady supplies of GDNF, and he hopes to begin implanting them into the brains of Parkinson's patients within the next several years.

"It's tying back with my stem cell work beautifully," Svendsen says.

— Michael Penn

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### **A Pooch in Time**

New findings from a UW-Madison veterinary expert suggest that our best intentions may not be doing much good for our best friends. After three decades of analysis, Professor Ronald Schultz has concluded that most annual vaccines given to dogs aren't necessary — and may be harmful. Schultz's data show that immunity from a single vaccination can persist through a dog's lifetime, while overvaccinating can increase the incidence of skin problems, allergies, and autoimmune diseases. Based on Schultz's work, a community of canine vaccine experts has developed new recommendations for vets that could make your pet's next checkup a little less ruff ... er, rough.



— M.P.

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