

# Worm research could aid farms

*Graduate student's experiments may help developing countries*

BY MICHELLE STARR  
Staff writer

Untying the life cycle of the Gordian worm may hold the clues to reducing world hunger, said Ben Hanelt, a graduate student working toward his doctorate in parasitology.

Hanelt, an international student from Germany, is one of two researchers worldwide currently working with the Gordian worm. The other researcher is in Germany, Hanelt said.

The worm kills pests that destroy crops in many developing nations.

"Ben is very rapidly becoming a world expert," said John Janovy, professor of biological sciences. Janovy provides his lab for Hanelt's research.

Hanelt began his research on the Gordian worm as an undergraduate in Albuquerque, N.M., 10 years ago. He is starting his third year of research at UNL.

"My goal was to complete the worm's life cycle. It's never been done before," Hanelt said.

The Gordian worm, a freshwater species in the Nematomorpha phylum, infects insects such as crickets and grasshoppers and then signals them to find water. The worm makes the insect commit suicide by jumping in the water, Hanelt said.

Once in water the Gordian worm is finished with its host and will crack through the insect's body.

When the worm infects the insect, it will castrate and kill the insect, Hanelt said.

Therefore, the worm could help developing nations by eliminating pests that are destroying their crops, Hanelt said.

Because the worms need water to survive, Hanelt's theory is to provide water troughs for the worm's reproduction and then take them away after the pests die, thus eliminating the worms, Hanelt said.

This would prevent overpopulation of Gordian



ABOUT 100 adult Gordian worms clump together next to a ruler, which measures in centimeters. Graduate student Ben Hanelt has been researching the worms for 10 years.

PHOTO COURTESY OF BEN HANELT

worms in the areas they are introduced to, he said.

Also, some of the worms are very specific and could eliminate specific pests, Hanelt said.

To make this possible, Hanelt needed to find the link between the worm in its larvae stage, which is found in streams, and the land insects that it infects.

Hanelt found that the worm in its larvae stage comes into contact with an aquatic insect, like a fly, also in its larvae stage. Then the worm infects the aquatic insect and is carried out of the water by its host.

The infected aquatic insect is then eaten by another insect, such as a grasshopper or cricket.

The worm, which is named after a Gordian myth because of the way the adult worms knot together, looks much like a horse hair.

The longest recorded Gordian worm was about 4.5 feet long, but they are usually between 1 and 2 feet long.

Although they are only parasitic when in insects, there are records of these worms infecting humans. Most of the published accounts, which are mainly from the United States and India, attribute infection from water or accidental ingestion of an infected insect, Hanelt said.

This past summer Hanelt presented his research on the Gordian worm at the American Society of Parasitologists meeting in California and won best student paper.

Janovy said: "It's exciting to see a grad student who is so thrilled about their work; so head over heels about animals."

## Quayle may pull out of GOP race

■ The former vice president wasn't able to raise enough to compete, a campaign official said.

WASHINGTON (AP) - Former Vice President Dan Quayle has decided to drop out of the Republican presidential race, after determining that he can't compete with George W. Bush's fund-raising juggernaut, a campaign official said.

Quayle will announce his intentions at a news conference today in Phoenix, said a senior campaign official, who spoke on condition of anonymity.

His departure winnows the GOP field to eight major Republican candidates and will increase speculation about the financial and political health of the remaining contenders.

Conservative commentator Pat Buchanan is on the brink of bolting from the GOP to seek the Reform Party nomination.

The Quayle official said the former vice president decided to quit this

weekend after consulting with his wife, Marilyn, and campaign manager Kyle McSlarrow.

The trio determined that Quayle could not raise enough money to compete deep into the primary season, even if he fared well in New Hampshire, the first-in-the-nation primary state.

Bush, the two-term Texas governor, has raised more than \$50 million — five times that of his nearest challenger. Quayle has been running a debt since early in the campaign.

Rep. John Kasich of Ohio, former Tennessee Gov. Lamar Alexander and Sen. Bob Smith of New Hampshire dropped out of the GOP primary contest earlier this year.

Kasich endorsed Bush. Alexander, like Quayle, cited Bush's fund-raising prowess as a reason for leaving. Smith is considering a third-party bid.

The former vice president is not expected to endorse a candidacy today.

Quayle's announcement comes as the remaining campaigns prepare to file their October finance statements that will disclose how well or poorly their fund-raising operations are doing.

## Two brothers found alive in quake rubble

TAIPEI, Taiwan (AP) - Two brothers were pulled to freedom Sunday after five and a half days buried alive in the wreckage of Taiwan's killer quake.

They said they survived by eating a few apples and playing cards in the small space where they were trapped.

Amid the devastation and shattered hopes, Taiwanese were cheered by the improbable survival of Sun Chi-kwang, 20, and Sun Chi-feng, who turned 26 on Wednesday, one day into their 130-hour ordeal in the wreckage of a collapsed Taipei building.

The brothers were rescued even as powerful aftershocks continue to jolt Taiwan. A particularly strong one hit early Sunday, killing at least three people on top of more than 2,000 who had already died.

Onlookers applauded as the younger Sun, stripped to the waist but staying upright and holding a bottle of water he got from rescue workers, was lifted to safety by a crane. His brother was rushed away on a stretcher.

Their mother, Liu Luan, heaved with sobs of joy as her sons came out alive, speaking so fast she was almost

incoherent.

"I kept thinking, 'This is not possible, this is not possible,'" Liu told reporters at the scene. "I kept praying for them all the time."

The brothers were hospitalized in stable condition. Doctors were checking them for possible internal injuries or dehydration.

The Sun brothers had been playing bridge when the 7.6-magnitude quake struck in the wee hours Tuesday. The 12-story building they were in crumpled, flattening parts of the hotel, offices and apartments it contained. The brothers' parents and sister were not at home at the time.

The two kept up their spirits by continuing their card game while they waited in the small space, their doctor said by telephone.

When their water ran out, they were forced to drink their own urine.

Sun Chi-kwang told TVBS television that while trapped he had "a very strange dream" in which "there was someone beside me saying that behind the fridge there was a hole from where I could get out."

"I thought that was really strange, and I told my older brother. He asked me what it meant and said fate could not have been talking to me, so I went back to sleep," Sun said.

"A little later I saw a hole, and indeed it turned out to be a big hole," he said, referring to the hole rescuers carved into the rubble to reach them.

The aftershock killed three people, injured at least 58 and buried another 20 in the rubble.

Deaths from the new tremor, and more bodies unearthed on Sunday, brought the confirmed toll from the quakes to 2,056.

On Saturday, President Lee Teng-hui signed a decree giving the military increased powers to maintain order.

The decree, which would supersede all existing laws for six months, still must be approved by legislators.

### World and Nation Datelines

#### ■ Washington IMF's debt relief initiative to aid poorest countries

WASHINGTON (AP) - The International Monetary Fund, under mounting pressure in the wake of a Russian corruption scandal, put in place a major new debt relief initiative Sunday and adopted a number of internal reforms aimed at improving the agency's management of future crises.

All the activity around the annual meetings of the 182-nation IMF and the World Bank was aimed at damping criticism that the two giant lending agencies failed to coordinate programs and badly mismanaged the recent global financial turmoil.

IMF and World Bank officials, at the first-ever joint meeting of the two agencies' policy setting committees, pledged in a statement to support "deeper, broader and faster debt relief" for the world's poorest countries.

The new coordinated effort will provide debt relief to 36 of the world's poorest nations. It is intended to erase up to \$100 billion in debt, allowing the countries to commit scarce resources to poverty, health and education programs.

#### ■ Cincinnati Springer hasn't ruled out political return

CINCINNATI (AP) - Television talk show host Jerry Springer, called the "ringmaster" for his raucous show known for its on-stage brawls, says he won't rule out a return to the political ring.

The former Cincinnati mayor says politics is his passion, and it's likely he'll return to the city one day to run for office.

He had considered a challenge to Republican U.S. Sen. Mike DeWine in 2000, but declined, saying he had committed his time to the show.

#### ■ Mexico Explosions leave at least 50 dead in Mexican city

MEXICO CITY (AP) - A series of explosions ripped through a crowded area of street stalls and shops across from a downtown bus station in the central Mexican city of Celaya on Sunday, killing at least 50 people, authorities said.

Media reports said the tragedy apparently began when a fireworks storehouse exploded about 10:30 a.m. A few minutes later there was a second large blast. Some reports said it was caused when gas tanks used for cooking exploded at a nearby restaurant, while others blamed more exploding fireworks.

The second explosion apparently trapped some rescuers who had responded to the first blast.

#### ■ Turkey Riots break out in prisons

ANKARA, Turkey (AP) - Left-wing inmates battled security forces at an Ankara prison for almost seven hours Sunday in a riot that left 10 inmates dead and sparked clashes in prisons across the country.

The violence began early Sunday morning in Ankara's Ulucanlar prison. Guards tried to enter a prison ward after being tipped that the inmates were planning to escape by digging a tunnel, the justice ministry said.

The about 50 inmates barricaded themselves in their ward to thwart the search, fired shots and hurled bombs at the security forces, the ministry's statement said.

The security forces fired tear gas before storming the ward. The subsequent fighting killed 10 inmates.

Rioting quickly spread to seven other prisons across the country. Left-wing inmates took at least 90 prison guards hostage, officials said.

## Daily Nebraskan

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The Daily Nebraskan (USPS 144-080) is published by the UNL Publications Board, Nebraska Union 20, 1400 R St., Lincoln, NE 68588-0448, Monday through Friday during the academic year; weekly during the summer sessions. The public has access to the Publications Board.

Readers are encouraged to submit story ideas and comments to the Daily Nebraskan by calling (402) 472-2588.

Subscriptions are \$60 for one year.  
Postmaster: Send address changes to the Daily Nebraskan, Nebraska Union 20, 1400 R St., Lincoln, NE 68588-0448. Periodical postage paid at Lincoln, NE.

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