ALUMNI

Nothing to Fear

Travels with a snake lover

At left: Kate Jackson with *Nerodia sipedon*, the snake that started it all, at Lake Ontario. Above: In the Republic of Congo, Jackson exultantly displays two (dead) cobras.

Few people devote their lives to creatures that have frightened and killed humans throughout history. Herpetologist Kate Jackson, Ph.D. '02, whose work with venomous snakes has led her to remote Africa and Latin America, cannot explain her own fascination, except to say that it predates kindergarten.

The first live snake she saw, at about age five, was a *Nerodia sipedon* (a common water snake), which her sister accidentally threw at her in a pail of water while they played on the shore of Lake Ontario. Her parents indirectly fed the passion. "I went to a French school in Toronto, and to make sure that I learned French, they gave me books on reptiles, because they knew I would feel compelled to read them," Jackson says.

Scientific aspirations came early. At 11, she dreamt of being curator of the Jersey Wildlife Preservation Trust in the Channel Islands—a pioneering zoo for conservation—so her parents took her there. "I wrote a letter, and the assistant curator wrote me back suggesting books I could read, and which animals would make good pets," she says. In junior high school, a biology teacher let her keep a few pets in the classroom, and paid for an enclosure for the alligator.

Even by academic standards, Jackson's dedication and daring fieldwork are unusual. "She is a congenital herpetologist—the woman loves serpents," says Agassiz professor of zoology Farish A. Jenkins Jr., who sat on her dissertation committee. "We have wonderful students—one, now, who is extremely intense about hairy frogs—but Kate is truly different. Someone who loves venomous snakes has to be a little eccentric."

Her dissertation examined the morphology and evolution of snakes' venom-delivery apparatus. This entailed getting cobra eggs from a zoo, on the condition they not be allowed to hatch. "I didn't know what the incubation period was—they hadn't been studied before—and every day I was opening one egg" to document its development, she explains. "One day, when a little snake came out and spread its hood and hissed at me, I thought, 'This is as close to hatching as I want to go.'"

Her doctoral supervisor, James Hanken, professor of biology and curator of herpetology and director of the Museum of Comparative Zoology (MCZ), praises her contributions as a "very good, popular" teacher and scientist. Using new information gained by biologists in the last 20 years about relationships among species on a molecular level, Jackson exhaustively reexamined the evolution of snakes' venom glands, associated muscles, and fangs. She pored over eighteenth- and nineteenth-century scientific literature and conducted her own dissections, elec-

Photographs courtesy of Kate Jackson

tron microscopy, and detailed embryologic studies. "It's not like people hadn't looked at these things before," Hanken says, "but it's rare to find anyone who considers all the data simultaneously."

Jackson concluded that the earliest venom-delivery apparatus formed in the Miocene (between 25 million and 10 million years ago), and that later, three separate lineages independently evolved more sophisticated versions, a process called convergent evolution. ("The exciting thing," Hanken adds, "now that we have more robust information on relationships, is that there seem to be more instances of parallel evolution than people had suspected previously.") She also found significant evidence that, counterintuitively, harmless snakes evolved from poisonous ones, losing a presumed advantage.

Jackson has no interest in the role snakes have played in legends and mythology across cultures, or in their various symbolic meanings; "I just like the real thing," she says (see www.zoo.utoronto.ca/kjackson). "The science I do is unfashionable. I don't study molecules in a lab. I do the kind of fundamental exploration that scientists did 200 years ago to study [the earth's] mammals. We're just way behind on amphibians and reptiles." Such singlemindedness has aided her career as a scientist and explorer, but probably contributed to her unwillingness to follow Hanken's advice about shaping her dissertation so that it would appeal to potential employers. "She's very persistent, which is good in the field," he says. "But she can be stubborn."

In her makeshift laboratory in Congo, Jackson takes tissue samples from a recent catch.

She was known as a risk-taker within the department. In 1997, she went to the relatively stable Republic of Congo (not the war-torn Democratic Republic of Congo) to collect specimens for the MCZ. Toward the end of the trip, she had to be airlifted out of the forest to a Camaroon hospital where she spent 10 days recovering from a swamp-borne, systemic infection that began in a tiny scratch on her leg. The initial dizziness hit her while she was alone in the forest and worsened as she lurched and swayed along, following a trail of thread she had unspooled to mark a return path to the satellite camp, where she collapsed in the tent with a high fever. Two fellow researchers nursed her through the night and helped get her back to the base camp and then on to a French lumber camp, from which she was evacuated two days later.

Poisonous snakes, her specialty, offer their own set of dangers. Neurotoxins released in a bite gradually paralyze the body but leave the victim conscious until the very end. "What kills you is that the diaphragm stops moving and the heart stops beating," Jackson explains. She has had a few close calls. She let a "playful little snake" slither through her fingers more than once before realizing that it was a baby forest cobra and laying it down "gently—no sudden moves," embarrassed that she had misidentified the creature. "We have all taken risks and made mistakes in the field and gotten away with it," she says. But not always. In 2001, internationally known herpetologist Joseph Slowinski, on his eleventh trip to Burma, with dozens of researchers, was bitten by a baby krait no thicker than a pencil—and up to 15 times more deadly than a cobra. He died before a rescue helicopter arrived.

Last year, Jackson approached Hanken about funding an independent research trip—a return visit to Congo. He refused. "Congo is a politically difficult place to work," he explains. "And a dangerous place to go." Farish Jenkins, a paleontologist, concurs. "To go to Congo alone is kind of crazy," he says. "I mean, I go to the Arctic with collaborators and I'm armed to the teeth."

Nevertheless, Jackson traveled in September to the remote Likouala District of northern Congo, having wrapped up her postdoctoral position at the University of Toronto. (She studied the sensory organs of three crocodiles housed in the department lab, and was the only one who would pick them up.) Once in Congo, essentially on her own, she waited three weeks in vain for a local wildlife-refuge official to give her a collecting permit. Finally she decided to pay a local Bantu chief to let her camp adjacent to the refuge with a hired cook and a guide, two tarpaulins, mosquito nets, and some pots and pans.

The trio lived together on a rare dry patch of land surrounded by flooded forests for five weeks during the rainy season and collected about 130 specimens of rare snakes, lizards, and frogs (including at least one species that may be completely new to the scientific community), all of them destined for the Smithsonian Institution, which paid for much of the trip. "Central Africa is sort of a black hole for herpetology," says Jackson. "There are tons of places to go where no herpetologist has ever been and where, within a couple hundred kilometers, you find no overlap in species. It is that diverse."

Money in Congo for such scientific endeavors is scarce. One professor she met at Brazzaville University had a fledgling fish collection in old mayonnaise and jam jars, but had so little formalin that only half of each creature could be preserved. "A lot of biodiversity in Africa is being lost at a terribly fast rate," confirms James Hanken. "Many species that have not yet even been formally described are probably going to go extinct before they are named."

Jackson herself hopes to publish a book on the largely undocumented snakes of Central Africa, research begun during her first visit to Congo. In addition to collecting for the Smithsonian, she is working with the Congolese National Laboratory on Public Health to reduce deaths from snakebite (a significant problem, because virtually no antivenoms are available). She is also seeking to train Congolese

graduate students in biodiversity techniques and hoping to open a small local museum of fauna, "so they don't have to rely on researchers like me to tell them what they've got."

Every day in the field, Jackson and her guide, Etienne Bokobela, waded into the forest's waters—chest-deep in some places—to check the fishnets they used to catch snakes that swim along the surface. "It was like Christmastime," she says. "You get to see what you've got." One day something was thrashing about furiously. Using all her strength, Jackson lifted the net and saw a snake whose head and neck were as thick as her forearm.

They had a water cobra (*Boulengerina annulata*) that turned out to be six and a half feet long. The 24-inch tongs she used to grab snakes from the water were useless; her hemostat wouldn't open wide enough to go around its head. She threw a snake bag at its mouth and "while it had its teeth in the bag, I went in, lightning fast, and grabbed its neck and held on tight, because it was wet and slippery," she recalls. "If it had gotten out even a centimeter, it would have bitten me. Cobras are not as fast as vipers, but they are more clever."

Once she had it by the throat, Bokobela cut off the netting with his machete. They carried the creature back to camp, emptied out the largest plastic supply bin they had, threw in a cloth doused with chloroform, and Jackson pushed the snake in, head-first, and shut the lid. "I was trying at that point to slow it down a little bit so I could take it out—I wanted a picture of a live snake, not a dead one," she explains. "And that's a dodgy decision to make, because they can recover quite quickly once they get some clean air in their lungs." She got her photograph—and measurements. Then she killed the snake, removed a piece of its liver for DNA sequencing, injected the carcass with formalin, wrapped it in toilet paper (they were out of cheesecloth), and stored it in a plastic bag.

Jackson says convincingly that she feels no fear while working. "It doesn't occur to me. People are frightened by different things," she explains. "It is just in my character to be brave and reckless and independent." On her apartment wall hangs a poster of the great British admiral Horatio Nelson, whom she has revered since she was 10. "He conquered Napoleon on the seas and he did it by ignoring orders to retreat and forging ahead," she says. "He lost an eye and an arm, but he won the battle."

Jackson's recent spoils include the water cobra, a species of frog she thinks has not been mentioned in the literature since 1924, and a roadkill snake possibly

Ballots, Please

This spring, alumni vote for a new group of Harvard Overseers and for elected directors of the Harvard Alumni Association (HAA) board.

Ballots should arrive in the mail by April 15 and must be received back in Cambridge by noon on June 2 to be counted. Results of the election will be announced at the HAA's annual meeting on June 8, on the afternoon of Commencement day. All holders of Harvard degrees, except Corporation members and officers of instruction and government, are entitled to vote for Overseer candidates. The election for HAA directors is open to all alumni.

For Overseer (six-year term, five to be elected):

Arne S. Duncan '86. Chicago. CEO, Chicago Public Schools.

Sandra Faber, Ph.D. '72. Monte Serena, Calif. Professor of astronomy, University of California, Santa Cruz.

Leila T. Fawaz, Ph.D. '79. Cambridge. Professor of history and diplomacy, Fletcher School of Law and Diplomacy, Tufts University, Medford, Massachusetts.

Ricardo H. Hinojosa, J.D. '75. McAllen, Texas. U.S. District Court judge.

Henry W. McGee III '74, M.B.A. '79. New York City. President, HBO Video.

Ann Moore, M.B.A. '78. New York City. Chairman and CEO, Time Inc.

Emily Pulitzer, A.M. '63. St. Louis. President, Pulitzer Foundation for the Arts.

Robert N. Shapiro '72, J.D. '78. Cambridge. Partner, Ropes & Gray, Boston.

For Elected Director (three-year term, six to be elected):

Neal Baer, Ed.M '79, A.M. '82, M.D. '96. Toluca Lake, Calif. Executive producer, NBC's *Law & Order: SVU,* Universal City, Calif.

Jeffrey Behrens '89. Newton, Massachusetts. Principal, Adviza Consulting.

James Bell '89. Greenwich, Conn. Executive producer, *Today Show,* NBC News, New York City.

Mary McGrath Carty '74. Belmont, Massachusetts. Executive director, The Lenny Zakim Fund, Boston.

Linda Hotchkiss '74, M.D. '78. Grosse Pointe, Michigan. Physician, Trinity Health Organization.

Patrik Johansson, M.P.H. '01. Washington, D.C. Physician; instructor of social medicine, Harvard Medical School; Kerr White visiting scholar, Agency for Healthcare Research and Quality; native investigator, University of Colorado Health Sciences Center.

Linda Kartoz-Doochin, M.B.A. '79. Nashville. Community volunteer.

Linda Niessen, D.M.D. '77, M.P.H. '77, M.P.P. '82. Dallas. Vice president, clinical education, Dentsply International.

Christina Tchen '78. Chicago. Partner, Skadden, Arps, Slate, Meagher & Flom, LLP.

The HAA nominating committee proposes Overseer and elected director candidates each year. The committee's 13 voting members include three current or former Overseers and 10 other alumni chosen by the HAA executive committee. Overseer and HAA elected-director candidates may also be nominated by means of petitions signed by a prescribed number of eligible degree holders and filed by a set date early in the year.

not known to exist previously in Congo. At press time, she was at the Smithsonian to begin the identification and cataloging process.

Meanwhile, another trip to Congo is in store—as soon as she finds funding, and a new job. Jackson does not fit neatly into any academic spot; a museum with a strong fieldwork program might be ideal. "What I don't want, after 25 years of knowing that I want to be a herpetologist, is to get a job teaching human physiology to undergraduates," she says. "I'm not that interested in humans." —NELL PORTER BROWN

HAA Clubs Committee Awards

THE HAA CLUBS COMMITTEE presents two annual awards for contributions to Harvard clubs.

Recipients of the 2005 **Outstanding Club Contribution Award** are:

William D. ("Dren") Geer Jr. '56, of Sarasota, Florida. Geer has been active on the Harvard Club of Sarasota's board for nearly a decade, and is the current club president. His contributions include the development of a "Teacher of the Year" program through which the club recognizes a local teacher who is given a stipend and invited to a Harvard Graduate School of Education (GSE) summer seminar; the trip is paid for by the club and the local school board. Geer is also working on further collaborations between the Sarasota County schools and the GSE that could result in a model program that could be used nationwide.

Rodney D. Hardy '60, of Edina, Minnesota. Hardy has twice served as president of the Harvard Club of Minnesota, most recently in 2004-2005. He and his successor, Todd Peterson '84, M.B.A. '87, oversaw the club's transformation into a University-wide organization. This included merging with the previously independent Harvard Business School Club of Minnesota and inviting alumni from all the University's graduate and professional schools to join the new organization. In preparation for its 125th anniversary, the club also waived 2005–2006 dues, which has resulted in a 10-fold rise in membership. Hardy, who is also a leader of his class, has served as HAA regional director for the North Central States and is a longstanding HAA committee member.

The Harvard Clubs of Chile and Switzerland won **Club Recognition Awards.**

The **Harvard Club of Chile** has been a model of revitalization, largely due to the expansion of its board to include representatives of the professional schools and to its significant outreach activities. To better serve and engage alumni in Chile and neighboring countries, the club has sponsored a series of academic and social events, including a dinner with Chile's minister of justice, Luis Bates. The club has also worked closely with the regional office of Harvard's David Rockefeller Center for Latin American Studies to help Harvard students studying in Chile, and now plans to create a scholarship fund for Chilean students attending Harvard.

The **Harvard Club of Switzerland** has an outstanding participation record, with 910 current members, many of them graduates of the Business School. The club offers an efficient on-line system for paying dues and is developing a website. Another key to its success is a committee and board structure that offers "stability, clear leadership, and representation from different alumni constituencies and regions." Alumni participate in a well-promoted series of 14 events annually.

Comings and Goings

UNIVERSITY CLUBS offer a variety of stimulating gatherings. Here is a list of Harvard-affiliated speakers appearing at local clubs this winter. For details, contact the club in question, call the HAA (617-495-3070), or go to www.haa.harvard.edu.

On March 2, the **Harvard Club of Broward County** hosts Thier professor of medicine David Blumenthal for a talk on "The History and Politics of Medicare." Also on March 2, Cabot professor of social ethics and Pforzheimer professor of Radcliffe Mahzarin Banaji will discuss "Mind Bugs: The Psychology of Ordinary Prejudice" at a **Graduate School of Arts and Sciences** event at the **Harvard Club of New York**

A Special Notice Regarding Commencement Exercises

Morning Exercises, Thursday, June 8, 2006

To accommodate the increasing number of those wishing to attend Harvard's Commencement Exercises, the following guidelines are proposed to facilitate admission into Tercentenary Theatre on Commencement morning:

- Degree candidates will receive a limited number of tickets to Commencement. Parents and guests of degree candidates *must* have tickets, which they will be required to show at the gates in order to enter Tercentenary Theatre. Seating capacity is limited, however there is standing room on the Widener steps and at the rear and sides of the Theatre for viewing the exercises.

Note: A ticket allows admission into the Theatre, but does not guarantee a seat. The sale of Commencement tickets is prohibited.

- Alumni/ae attending their major reunions (25th, 35th, 50th) will receive tickets at their reunions. Alumni/ae in classes beyond the 50th may obtain tickets from the Classes and Reunions Office, 124 Mount Auburn Street, sixth floor, Cambridge, Massachusetts 02138.
- Alumni/ae from non-major reunion years and their spouses are requested to view the Morning Exercises over large-screen televisions situated in the Science Center, Sanders Theatre, most of the undergraduate Houses and professional schools. These locations provide ample seating, and tickets are not required.
- A very limited supply of tickets will be made available to all other alumni/ae on a first-come, first-served basis through the Harvard Alumni Association, 124 Mount Auburn Street, sixth floor, Cambridge, Massachusetts 02138.

Afternoon Exercises

The Harvard Alumni Association's Annual Meeting convenes in Tercentenary Theatre on Commencement afternoon. All alumni and alumnae, faculty, students, parents, and guests are invited to attend and hear President Lawrence H. Summers and the Commencement Speaker deliver their addresses. Tickets for the afternoon ceremony will be available through the Harvard Alumni Association, 124 Mount Auburn Street, sixth floor, Cambridge, Massachusetts 02138.

—Jacqueline A. O'Neill, University Marshal