

## Congo Report

**The charismatic,** maverick field anthropologist Patrick Tracy Lowell Putnam '25 moved to what was then the Belgian Congo in the 1930s to study the Mbuti Pygmies. On a visit back to the United States, he met New York artist Anne Eisner, who was seduced by his tales of a primitive people living in an exquisite tropical forest, fell in love with him, and bought a one-way ticket to Africa in 1946, leaving her promising career in Manhattan to join him at Camp Putnam—a sort of dude ranch with a guesthouse

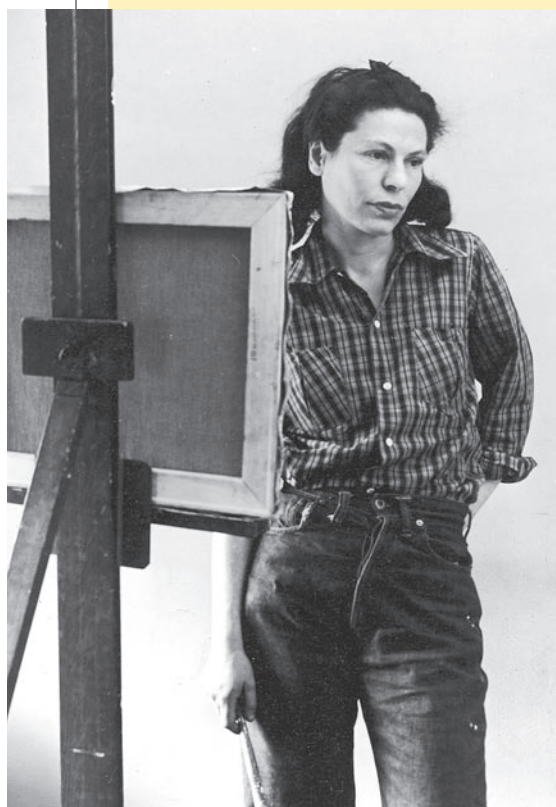
on the Epulu River at the edge of the Ituri rainforest.

"Eisner was an eccentric in the colonial context, creating a role that few—inside or outside the colonial hierarchy—could comprehend," writes Christie McDonald in a new book she edited, *Images of Congo: Anne Eisner's Art and Ethnography, 1946-1958* (5 Continents Editions, \$39). "She was the first white woman to spend extended periods of time in Mbuti Pygmy camps, where they hunted and she painted; she transcribed 200 Pygmy legends; and she wrote extensive ethnographic notes, taking up where

Putnam—whom Eisner married in 1948—left off. The people of the area showed their confidence in Eisner by asking her to care for three orphaned Pygmy babies whom she brought up during their early life within a wide network of 'mothers.'"

McDonald is Smith professor of French language and literature and chair of the Department of Romance Languages and Literatures. She is also Eisner's niece, and the papers of the painter-ethnographer came to her in the mid 1980s. She put them in order and gave the archive, including 70 drawings and many photographs, to Houghton Library, which already had Patrick Putnam's papers. She also called together colleagues in several disciplines for a workshop in 2002 to discuss Eisner's work. Among the contributors to *Images of Congo*, which grew out of this collaboration, are Suzanne Preston Blier, Clowes

At left: Anne Eisner, circa 1941. The photograph, in the Houghton Library, is possibly by Aaron Siskind. Below: *Mother with Child II* (1957).



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## Scanning Species

ON JUNE 26, 1974, merchandise tracking was revolutionized with a 10-pack of Wrigley's Juicy Fruit chewing gum. The gum package, today sequestered in the Smithsonian, was the first nationally bar-coded item to be scanned at a supermarket checkout (in Troy, Ohio) and the result of a quarter-century-long effort to reduce product information to a little rectangle of stripes that a machine could read instantaneously. The new technology could identify an item anywhere in the country, regardless of its shape or brand.

A group of scientists at Harvard and other universities now think that a ver-

sion of this system could help keep track of the planet's biodiversity, too. The Consortium for the Barcode of Life (CBOL), which counts Harvard's Museum of Comparative Zoology (MCZ) as a member, is promoting a technique known as DNA barcoding to build a database that could identify most species immediately from a short stretch of DNA. Begun in May 2004, CBOL already includes nearly 70 member institutions in more than 30 countries and has begun collecting data for birds and marine fish, which are relatively straightforward to barcode.

Supporters of DNA barcoding say that every species on the planet, like every brand of macaroni, bears a tag distin-

guishing it from every other species: the DNA found in every cell. That's not a novel idea in itself. (A similar premise is used to identify individuals whenever a suspect's DNA is tested against a crime scene.) One of the things that makes barcoding new—and controversial among biologists—is that it aims to make this analysis using less than a single gene. An animal's "barcode" is the stretch of mitochondrial DNA in the cytochrome c oxidase I (COI) gene, which is among the genes that code for protein.

Barcoders have chosen this sequence of about 650 base pairs because it's easy to isolate, differs significantly among species, and tends to be relatively consistent. Mi-



professor of fine arts and professor of African and African American studies; F. Abiola Irele, who teaches in that department and in McDonald's; Kay Kaufman Shelemay, Watts professor of music and a member of the African and African American studies department; and six others from outside Harvard.

Anthropologist Colin Turnbull, who spent a total of seven months at Camp Putnam in 1951 and 1954, made the Pygmies famous in his very popular book *The Forest People* (1961), portraying them as leading a life of freedom, equality, and goodness in blessed isolation from the farmer villagers and everyone else around them. Eisner did not share his view of reality, finding the Pygmies and their neighbors much less polarized. Although Turnbull relied on Eisner for access to her beloved Pygmies, and with her permission used her ethnographic notes, he barely mentions her name in his writing. Indeed, it was in part because Eisner had been left out of the history of the area that McDonald was moved to write her back into it. "The fact that Anne Eisner recorded her experience in the Congo rainforest not only in words, but in the symbolic mode of art," she writes, "...lends her work a special significance for the study of culture, which ultimately rests on the capacity for understanding."

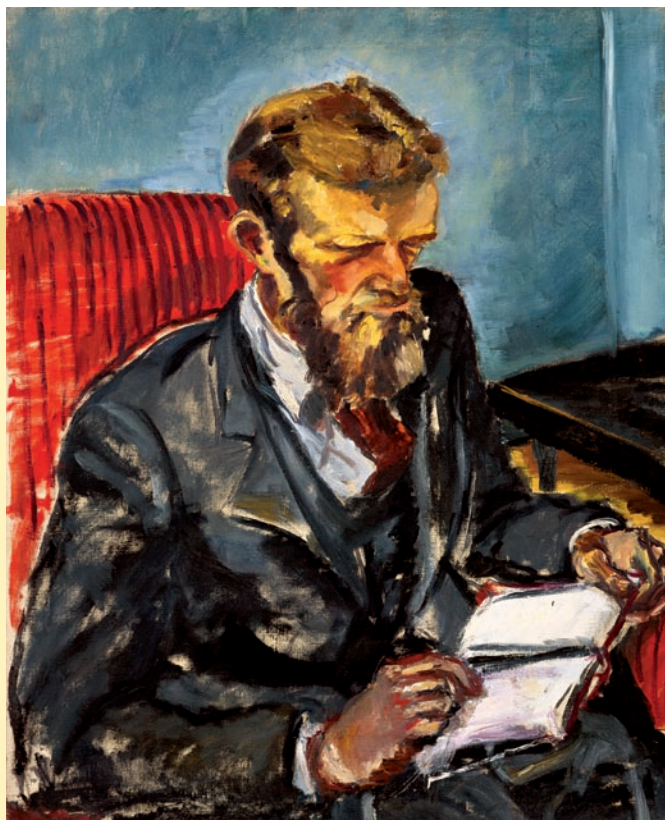
**All the paintings are oil on canvas; all are in private collections.**

tochondria also have many more copies of the genetic sequence than do cells' nuclei, making it easier to obtain the necessary data. (Plants, which have a slower rate of mitochondrial evolution, currently present a problem; researchers hope to use a gene from their chloroplasts instead.) Identifying a species by a fragment of one gene—faster and cheaper than analyzing an entire DNA sequence—resembles distinguishing two novelists on the basis of a single sentence. It isn't hard to differentiate Faulkner from Hemingway, but what about Wodehouse and Waugh? Yet for those who hope to record the planet's biodiversity, time is of the essence. Many of the least documented species are also

among those vanishing most rapidly, perhaps even before being discovered.

Barcoding's critics say that closely related species could present misleading obstacles for the technique. Barcoding works only if genetic variation *within* a given species is significantly less than genetic variation *between* species. This is not the case among prokaryotic organisms—it currently takes at least six genes to distinguish most bacteria—and it's sometimes untrue even of more complex life forms. Hybrid species and amphibians, whose genes tend to differ by location, also present barcoding challenges. These concerns, in fact, impelled James Hanken, professor of biology as well as Agassiz

**Paintings, clockwise from top left: *The Women* (1956). Patrick Putnam (1945). He died in 1953, after which Eisner attempted to run Camp Putnam by herself. *Ituri Forest IV* (1960). Eisner broke her hip in 1958 and left Africa for the United States and an operation. She never returned, but continued to paint her rainforest experiences from memory. She died of cancer in New York City in 1967 at 56.**



professor of zoology and director of the MCZ, to get involved in the project: herpetology, the study of reptiles and amphibians, is his specialty. Three years ago, when barcoding was still in its embryonic stages, he wrote a lengthy critique "of the



specific proposal as it was presented,” he says. “But I also felt that the idea that they were proposing—of using a short molecular gene sequence from a particular gene to identify species—actually had merit.”

To his surprise, he was invited to the next symposium on the topic, and then to another, where he suggested barcoding couldn't succeed without support from the existing community of taxonomists and museums of natural history. “If your ultimate goal is to use barcoding to discover new species, then it had better work to recognize already named species,” he explains. “It should be based, operationally and logistically, in museums and herbaria, because that's where there's ex-

## Barcoding is useful for dealing with plants and animals that don't have two tusks and a gray trunk.

border guards and agricultural specialists, many of whom don't have extensive taxonomy backgrounds, a tool to help flag possible hazardous organisms. The economic fillip comes from enabling researchers in the field to identify specimens cheaply and within a matter of minutes.

The cost of finding the DNA sequence of a given COI gene is relatively inexpen-

examining specimens in a Cambridge lab—to enter a sequence they've derived from a sample and, ideally, pinpoint the species it came from.

Barcoding doesn't claim to be a taxonomical panacea, though; it's a tool that might not always be necessary or sufficient. Hanken gives an example: “Say somebody's walking toward you, dragging an elephant....You don't need to sequence it.” Barcoding is useful, according to supporters, for dealing with plants and animals that—like most of the globe's 1.7 million known species—don't have two tusks and a gray trunk. “Somebody is digging underground and comes up with a larval insect, which is nondescript, doesn't have any distinguishing features,” Hanken offers. “At that point, the gene sequence is probably one of the easiest ways to identify it.”

The technique's strictly genetic approach to identification, in other words, is ideal where visual or behavioral clues are absent or misleading. It may eventually help to identify untagged specimens, in the MCZ and elsewhere, that have puzzled scientists for years. (Because some barcoding will be done from museum specimens, in which aldehyde preservatives may have decomposed DNA material, CBOL researchers are also working with commercial chemical companies to find ways of salvaging preserved genes.) Even so, its proponents say they don't believe it should replace current taxonomical science. “What barcoding can do is help flag potentially new species—and quickly,” Hanken says. “At that point, though, it requires a specially trained taxonomist to examine the specimen and take into account all of the things used to describe species—morphology, behavior, color, where it's found.” Barcoding can suggest approximately where on the tree of life a new species belongs, but it can't point to a particular twig.

Under Hanken's aegis and with sup-

pertise.” The organization has taken his advice. Hanken, meanwhile, was invited to coordinate what became the formative conference for CBOL, sponsored by the Sloan Foundation. Today he serves on the group's executive committee (although he plans to step down shortly to make space for more foreign scientists).

CBOL's motivation in compiling a library of gene sequences is partly democratic and partly economic. The democratic part has to do with giving people like

sive—about two dollars a sample—and much faster than shipping off unknown specimens or bringing in specialists. What can be more costly and logistically challenging is getting the DNA sample itself: isolating the gene requires equipment, travel, and expertise. As species' DNA sequences are collected, they are entered in the Barcode of Life's database, which holds 36,000 genetic barcodes as of this writing. The database enables researchers collecting beetles in Brazil—or



James Hanken, seen in his laboratory, uses a thermocycler and DNA sequencing equipment in his work on species identification.

## Silent Justice

U.S. Senators seeking a paper trail of the career and views of Supreme Court nominee John G. Roberts Jr. '76, J.D. '79, won't find much in his College class reports. The summa cum laude history concentrator (he wrote his senior thesis on "Old

and New Liberalism: The British Liberal Party's Approach to the Social Problem, 1906-1914") did not file narratives in any of

**John G. Roberts Jr.**

the five-year class compendiums. The higher-education press was quick to note his familiarity with college and university issues from his private practice at Hogan & Hartson. If confirmed, he would be the sixth sitting justice educated at Harvard Law School, and might have an interesting entry for his thirtieth-reunion report.

## The \$31-Million Solution

On August 3, the University announced it would pay \$26.5 million (of \$31 million overall) to settle the federal civil suit over advisory work on economic reform in Russia in the 1990s. Details will be reported in the next issue.

## Radcliffe Roster

The Radcliffe Institute's 51 fellows for 2005-2006—40 women and 11 men; see [www.radcliffe.edu](http://www.radcliffe.edu) for the complete list—include a large Harvard delegation: art historian Suzanne Preston Blier (studying African antiquities); historian Vincent Brown (Atlan-



**Margarita Estévez-Abe**



**FRESH FACE, OLD FOOT:** During his four-city tour of the United States, Vietnamese prime minister Phan Van Khai stopped by Massachusetts Hall on June 24 to talk with President Lawrence H. Summers about economic development and public-health issues such as AIDS and avian flu; joined a Kennedy School panel on enhancing higher education in Vietnam; and, in between, managed an iconic toe-touching in Harvard Yard. Khai is the highest-ranking Vietnamese official to visit since the end of the war in 1975.

tic slavery); government scholar Margarita Estévez-Abe (occupational segregation by gender); Medical School instructor Alice Flaherty (mechanisms of denial and disease); economists Claudia Goldin and Lawrence F. Katz



**Alice Flaherty**

(leading a cluster of scholars examining career and family choices among college graduates); political scientist J. Russell Muirhead



**J. Russell Muirhead**

(on right and left in party politics); biologist Naomi Pierce (the evolution of blue butterflies); educational historian Julie Reuben (campus protests in the 1960s); literature scholar Susan R. Sul-  
**Mary C. Waters** (art by child survivors of the Holocaust); and sociologist Mary C. Waters (the transition to adulthood).



**Mary C. Waters**

## Global Health Grants

Two faculty leaders of Harvard's Initiative for Global Health received major grants from the Bill & Melinda Gates

Foundation's "Grand Challenges in Global Health" program, which announced commitments of \$437 million to 43 research teams on June 27. The program is pursuing 14 scientific challenges, from developing better vaccines to pioneering ways of preventing drug resistance. McKay professor of the practice of biomedical engineering **David A. Ed-**



**David A. Edwards**

**wards** was granted \$7.6 million to work on reformulating tuberculosis and diphtheria vaccines, currently injected, into aerosol sprays. HIGH director Christopher Murray, Saltonstall professor of population policy and professor of social medicine, received \$18.8 million for work by an international team of researchers on generating new methods to assess the health status of developing nations. (Both professors' work is described in "Global Health Aims HIGH," January-February, page 61.) Three days later, Oracle Corporation chief executive Larry Ellison told the *Wall Street Journal* that his foundation planned to give Harvard \$115 million, primarily for a study, directed by Murray, of the effectiveness of various interventions designed to improve global health (see [www.global-health.harvard.edu](http://www.global-health.harvard.edu) for a project outline by Murray); about \$15 million would support new professorships. The gift, much hinted-at by Ellison and discussed among faculty members, had not been finally negotiated at press time.

## AIDS Action

The Center for HIV/AIDS Vaccine Immunology, established in

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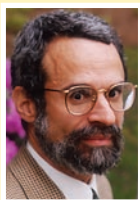
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**Norman L. Letvin**



**Joseph G. Sodroski**



**Stephen C. Harrison**



**Raphael Dolin**

July by the National Institutes of Health, will include significant representation from Harvard Medical School. The new center, a consortium of universities and research centers under the direction of Duke's Barton Haynes—funded initially with \$15 million, with the potential to conduct hundreds of millions of dollars of research in coming years—includes among its scientific leaders professor of medicine Norman L. Letvin, who will also oversee work on vaccine production, and professor of pathology Joseph G. Sodroski. Professor of biological chemistry and molecular pharmacology Stephen C. Harrison will direct structural-biology work, and

Finland professor of medicine Raphael Dolin, dean for academic and clinical programs, will direct clinical activities.

## Nota Bene

**CHAMPION CHEMIST.** Flowers University Professor George M. Whitesides received the 2005 Welch Award, which carries a \$300,000 honorarium, in recognition of his productive career in chemistry, which has recently included pioneering work in nanoscale materials (see "Thinking Small," January-February, page 50). Separately, he and Ramsey professor of managerial economics emeritus Howard Raiffa were among the 74 newly elected members of the National Academy of Engineering.

**TELESCOPE TURNED OFF?** The Oak Ridge Observatory, built in the 1930s in Harvard, Massachusetts, may be shuttered. Its five-foot mirror, the largest optical telescope in the United States east of Texas, has become increasingly obsolete, and suburban light pollution limits observing. The facility, owned by the Harvard-Smithsonian Center for Astrophysics, has been supported by the Smithsonian Institution, which intends to terminate funding at summer's end.

Other instruments at the site, including a radio telescope, will remain in service.

**FLUXUS FOUNDATIONS.** Harvard University Art Museums has acquired by gift and purchase the Barbara and Peter Moore collection of "Fluxus" art—121 works from the loosely affiliated international artists' movement of the 1960s and 1970s. Among those represented in this postwar potpourri are Christo, Claes Oldenburg, and Yoko Ono.

**COMINGS AND GOINGS.** Former New Hampshire governor Jeanne Shaheen became director of the Kennedy School's Institute of Politics on July 1.... David W. Scudder '57, vice president of trusts at Harvard Management Company since 1999, departed July 1 to join the new Aria Asset Management. As head of the 17-person trust unit, Scudder secured IRS permission for HMC to manage planned-giving donors' funds as endowment, and helped create tax-efficient portfolios for Harvard benefactors.... The Schlesinger Library on



COURTESY OF MARILYN DUNN

the History of Women in America, part of the Radcliffe Institute, has appointed Marilyn Dunn executive director. Dunn, who came from Hartwick College's library, succeeds Megan Sniffin-Marino, who is now University Archivist.... The Harvard Museum of Natural



**Elisabeth Werby**

**Natural History.** Harvard University Art Museums has appointed Elisabeth Werby '72 its new executive director. Werby had been at the American Museum of Natural History in New York. ...Recent transplants from similar posts at Dartmouth include Ryan Travia, who became Harvard's director of alcohol and substance-abuse services

on August 1 (see "Countering Alcohol," January-February, page 75), and Lawrence M. Levine, now the Faculty of Arts and Sciences' associate dean and chief information officer.... Gearing up for an overhaul of the Fogg (see "Harvard Portrait," July-August, page 56), the Harvard University Art Museums appointed Bradford W. Voigt as its first director of institutional advancement;



**Bradford W. Voigt**

he served previously at the Peabody Essex Museum and the Kennedy School of Government.... Abigail Lipson, formerly a counselor at the Bureau of Study Counsel, was named its director, effective on September 1; most recently, she directed American University's mental health and counseling services.



**DENTAL DESTINATION:** Harvard School of Dental Medicine capped off Commencement week by dedicating its new Research and Education Building on June 10. The six-level structure brings together more than 300 researchers, faculty members, and staff in a single building for the first time in more than two decades. Reflecting HSDM's ties to Harvard Medical School and emphasis on scientific research, the building incorporates new laboratory facilities for molecular dental medicine.

port from a handful of other faculty members, barcoding is slowly becoming the norm in some of the MCZ's highest-profile research. Hessel professor of biology Naomi Pierce, the MCZ's curator of Lepidoptera, and Pellegrino University Professor emeritus E.O. Wilson have started barcoding specimens they collect in the course of their work. Professor of biology Brian D. Farrell is incorporating the technique into his work on the Boston Harbor Islands All Taxa Biotic Inventory, which aims to compile a record of all invertebrate life on the islands.

Some hope to get their students involved. "Many high-school students—and certainly undergrads here at Harvard—are using the [DNA sequencing] technique that goes into this barcoding effort," reports professor of organismic and evolutionary biology Scott V. Edwards, the MCZ's curator in ornithology, who is helping coordinate a bird-barcoding initiative. "What will be more exciting, I think, is...to obtain feathers, eggshells, droppings of birds from the field and actually see what species have been there using the barcoding database." Indeed, barcoding should be ideal for ornithology: birds often have to be tracked by their biological detritus, which contains genetic material. The technique might even be useful for what Edwards calls "forensics." "When you get air strikes—when a bird hits an airplane—you may end up just with a bag of feathers," he explains. "Whodunnit, so to speak? Was it Mr. Crow or Mr. Laughing Gull?"

Still, Edwards admits the "actual field logistics"—tracking down and sequencing specimens from all corners of the globe—"could be formidable." The effort is already underway, though, and he expects that all North American birds will be entered into the database by the time the first workshop of the MCZ's Barcoding All Birds project, which he is co-organizing, occurs in September. The meeting will officially kick off CBOL's campaign to amass genetic barcodes for all 10,000 known species of birds. "I think this workshop will be crucial for establishing legitimacy in ornithology," Edwards says. "We've been fortunate to recruit, one, some of the leading ornitho-

logical scientists in the country and, two, some of the most skeptical ornithological scientists. And we said, 'Look, here's your chance to define the tenor of this project.'"

Hanken says that even though the technique probably won't produce an infallible gold standard for species identifi-

cation, he's optimistic. "These early efforts of barcoding are as much to validate the concept as to keep a file," he explains. "It remains an open question as to whether barcoding will work on a global scale. That being said, the initial results, as they're coming in, are very promising."

~NATHAN HELLER

## HARVARD BY THE NUMBERS

### Women in the Sciences

**IN ITS REPORT ISSUED IN MAY**, the University's Task Force on Women in Science and Engineering dramatically highlighted the "leaky pipeline" at work in academic science: its data, shown below, demonstrate that plenty of undergraduate women study the natural sciences at Harvard, and women now outnumber men in Medical School and School of Public Health doctoral enrollments. But the tenured professoriate is overwhelmingly male. As hiring increases in the sciences, the gender composition shown here may begin to change, especially if the University succeeds in its announced strategy of appointing more professors from its junior-faculty ranks, where women are more equally represented today. But that, in turn, depends in part on whether conditions for work and research improve for the tenure-track faculty.

