

Alaka Wali

Born: India Madhya Pradesh

Education: B.A., Radcliffe College (Harvard University); Ph.D., Columbia University

Came to Field Museum: 1994

Position: John Nuveen Associate Curator in Anthropology; Director, Center for Cultural Understanding and Change

Career

What do you do at the museum?

My research program has concentrated on understanding the impact of global >economic restructuring on the ways people organize themselves and constitute their social identities. The research has taken place in Central and South America and also in urban areas in the United States. My aim is to use the results to formulate more humane solutions to social problems.

How did you get interested in this field?

My freshman year at Harvard I took a class called Seminar on Thought in which we read a series of articles and discussed them critically. Many of them were, in fact, classic pieces of anthropology. I just didn't know it because the professor didn't talk about it as a discipline, even though he was an anthropologist.

When I came back in my sophomore year I chose English as a major, but I was not very thrilled with my classes. That anthropology professor suggested I do field work somewhere to see if I liked it. Harvard had something called the Chiapas Project, a long-term field project looking at the modern Mayan communities in Chiapas, Mexico. They took students down there to do ethnographic fieldwork every summer.

I was interested in going but I didn't speak Spanish, so I spent the summer in Mexico, living with a family and learning the language. While I was there, I did a project on folk songs. I fell in love with the idea of fieldwork and with Latin America, especially Mexico. It seemed very similar to what I remember of my own country, India.

The next summer I did fieldwork with the Chiapas Project and I became interested in anthropology as a discipline because it seemed to answer some questions that I had based on my experiences growing up as a foreign person in this country, questions about what it means to have a cultural identity.

Also at that time at Harvard there was a core group of junior faculty and graduate students who were thinking about how you use anthropology to address pressing issues. One issue they were looking at was the question of human rights for indigenous peoples. We were becoming aware that threats to their land were increasing, especially in South

America and Central America. That combination of human rights for indigenous people and using anthropology to address some of those issues appealed to me.

What do you love about what you do?

I love that every time I do anthropological research, I become more and more amazed at how creative people are in so many different ways. To me that is so exciting, and it enriches my life.

Have you ever encountered any gender barriers in your career path?

It's a complicated issue. I was the oldest of three daughters in my family and my father was a very non-traditional Indian. He's a physicist, and he had kind of eschewed religion and Hindu traditions. He believed in the pursuit of intellectual ideals, knowledge and truth for their own sake.

And my mother also was a very non-traditional Indian. She had eschewed the role for middle-class women--marriage and family--and had gone off to seek higher education.

So both of them came from this background where their children were not going to follow traditional roles. I was always raised with the expectation that I should do whatever I wanted to do as long as it was in the pursuit of knowledge and truth. Anything less than that was not worthy of pursuit.

It was never in my toolkit to think I couldn't do something because I was a woman. Maybe there were times when there were barriers and I didn't perceive them because I just barreled straight ahead.

I resisted being channeled into doing certain kinds of research a lot of times women were told to do--like research on women. Similarly, a lot of the students of color were subtly or not so subtly pushed to do research on their own people. That's kind of a weird thing in anthropology.

I wanted to do research in Latin America--and you don't find too many Indian anthropologists doing that. I resisted being put into traditional categories and I think that helped my career.

What about the role of gender in science in general?

The interesting thing to me about gender is that it's complicated. It's not about the women-are-oppressed-and-men-aren't kind of thing. I don't think we really understand what gender's effect is in different cultures. It's only since the mid-1970s that anthropologists themselves began to pay attention.

Science can be looked at in a social context just like anything else. All science is a method of inquiry into phenomena. It's nothing more and nothing less than that.

Some people say that science was deeply patriarchal in its origins. I don't really know how they come to that conclusion because it seems to me that science is a method that enables anybody to look at the world in a particular kind of way and there's nothing male or female about it. There's nothing ethnic about it. It transcends those things.

The way it has been practiced has been exclusionary, yes. What that has resulted in is that the types of problems that scientists investigate and some of the experimental methods that they use are shaped by gendered perspectives. In a sense gender does matter in that people have different approaches based on their social experiences. Men raised in a certain way and women socialized in another way aren't going to think about problems in the same way.

It just stands to reason that the more you can get folks of diverse perspectives in there doing research, the better off you'll be. Anybody can use the scientific method-its design is not based on gender. There's no difference in how men and women do it.

What's maybe different is the type of research problem you choose to do because you have a different perspective. You may be asking different questions and that's great, because who wants to ask the same questions? We'll never get more insight that way.

It's when women entered anthropology and started asking different kinds of questions that we began to have a whole new paradigm for understanding social organization. Today, no anthropologist would not consider gender.

Goals

What would you like to accomplish through your work?

I'm a very strong believer that anthropology has a lot to say about humans and I think we haven't done a good job speaking to public audiences about what we know. I'm very interested in creating a voice for anthropology in the museum and in the public realm.

Role Models

Did you have any role models growing up?

Marie Curie. I also admired a woman pathologist who was a friend of the family.

Advice

What advice would you have for a young person interested in going into anthropology?

Go for it. It's a fun discipline, especially now, when the field has opened up so much and there are so many interesting things to look at and we actually know a lot. The questions you can ask are that much more complicated. It's a good time to go into anthropology.

Debra Moskovits

Born: São Paulo, Brazil

Education: B.S. Princeton University; Ph.D. The University of Chicago

Came to Field Museum: 1985

Position: Director of Environmental and Conservation Programs

Career

What do you do at the Museum?

As director of Environmental and Conservation Programs (ECP) my main role is to help find rapid, cost-effective ways to translate the wealth of biological information in our Museum – in the tremendous expertise of our scientists, in our huge collections – into effective conservation action on the ground. We work in the Chicago region and around the world.

How does conservation fit into your other roles?

A lot of the work of conservation biology, in my view, is problem solving: How do you get people to work together towards a solution? How do we apply what we already know to come up with our best-informed guesses about priorities and management?

In many ways, my job is about finding the best people in the field and then helping channel their creative and intellectual energies into concrete, immediate results. Partnerships are key: ECP partners with other research institutions, regional and international conservation organizations, local communities, and government agencies. Our work is very much driven by urgent needs, and the more we can find expert partners to fit the job, the better the result.

How did you become interested in your field?

I've always been fascinated with the way animals interact with each other and with their environment. Ever since I can remember that was my passion. But I didn't understand as a kid, that this could become a career. When I came to college in the States, I was thrilled to learn about bird watching and field studies. I got instantly hooked. Since then I've studied the behavior and ecology of woodpeckers in North America and of monkeys and tortoises in several rain forests in South America.

As much as I love being outdoors and learning about incredible creatures, my primary concern is to apply our growing body of knowledge to the long-term protection and conservation of wild animals and wild places.

What do you love about what you do?

I love nature and am happiest out in the field. I believe that we, humans, have an incredible opportunity to thrive side by side with unique biological treasures. Ultimately, when we figure out how to allow wilderness not only to survive, but also to flourish in our midst, human communities will benefit as much as our non-human neighbors.

Do you find that your career in conservation is a good fit for you?

Yes. I thoroughly admire gifted field biologists, and although I'd love to be one of them, my skills lie more in *finding* these incredibly talented people, and helping coordinate their efforts with urgent needs in conservation action.

Describe your database project?

In the Museum's vast research collections – our 20 million specimens of plants, animals and fossils – we have much of the key information we need to set effective priorities for conservation action. What we don't have is time. And it takes much too long to sort out all specimens, read every tag, compile all the relevant information.

But now that these records have been entered into computer databases, we can ask key questions of urgent conservation relevance, and get the answers in a matter of minutes. For example, from analyzing a large computer database on the ecology and distribution of birds in the American tropics, we find that the region of immediate priority for conservation – the region where unique species will disappear unless we act now – is the savanna/dry forest region of central South America. That region is rapidly turning into gigantic soybean fields, following the path of prairies and oak savannas in most of Illinois.

Besides speed, the power of databases lies in the capacity of computers to consider whole *communities* at once, rather than treating species individually, one by one. Finally, computer analyses can indicate trends, and point you to the communities about to become endangered if current patterns continue. So you can take action *before* it's way too expensive – or worse, too late – to make a significant difference.

How are the Museum's conservation projects significant locally?

The Museum has always had a major commitment to Chicago-based programs. But Chicagoland residents are extremely lucky. Within our metropolitan region survive some of the world's best remaining examples of eastern tallgrass prairies, oak savannas, open oak woodlands, and wooded and prairie wetlands. The Museum has played a leadership role in helping launch *Chicago Wilderness*, a groundbreaking partnership of over 70

diverse and determined organizations in the region, dedicated to the preservation of the globally endangered natural communities in our own backyards.

In the vision of Chicago Wilderness, Chicago will be known as a place whose people have a passion for wilderness, and the foresight and ingenuity to save their piece of it.

Do you ever find conservation work depressing?

Some people ask, “How do you keep yourself upbeat?” But there is much to feel upbeat about. People are changing. Governments are changing. Conservation is increasingly at the forefront of people’s minds. Collaborations work. It’s up to us to reverse the damaging trends.

Have gender issues affected your career in any way?

Certainly most of my science classes – both during undergraduate and graduate school – were dominated by male students and faculty. But I don’t think that affected me too much. In conservation biology I believe that the sex ratio is more even than in other sciences. Culturally and/or biologically, women seem to have a certain facility with problem solving, with focusing on how to get people to work together towards a solution. In conservation biology, that is a major plus.

Goals

What would you like to accomplish through your work?

The Field Museum is extremely rich in scientific and public education resources that can immediately inform and affect conservation action and policy. ECP’s goals are to link these resources to needs in conservation biology as effectively and rapidly as possible.

Museum scientists are masters in identifying biological diversity. ECP sets up programs for rapid inventories of sites for conservation, and for rapid design of integrated ecological monitoring. The collections themselves, when used creatively, become invaluable tools for identification in the field and for accelerated transfer of expertise. And content-rich, participatory environmental education programs are key for expanding community support and involvement.

In ECP we share the belief that the world’s biological wealth is the principal in a savings account – an account accumulated over millions of years of evolution that sustains all life. Our fundamental challenge is to find out how to live on the *interest* from that account, rather than exhaust the principal. ECP’s role is to help identify biological capital, to discover the ecological links between principal and interest, and to provide those who draw on this natural account with the knowledge and the tools to use their saving carefully and to protect them into the future.

Role Models

Who inspired you when you were growing up?

I would say Nature itself, because I grew up in a place with such rich wilderness treasures (even though São Paulo is a huge city). But my grandmother, an animal and nature-lover herself, encouraged me by sharing with me her love of the outdoors and memories of nature in her youth.

Advice

I believe that if you go with your passion, with what deeply interests you, chances are high that you'll succeed. If you fully believe in what you're doing, you tend not to question as much the hardships you encounter along the way to achieving your goals.

Francie Muraski-Stotz

Born: Villa Park, Illinois

Education: B.S. 1981, Purdue University; M.S. 1990, University of Chicago

Came to Field Museum: 1990

Position: Senior Exhibit Developer

Career

What do you do at the museum?

I've been working as the developer in charge of Underground Adventure, an exhibit about soil biodiversity and ecology and also about the human connection to soil. About a third of the exhibit is an immersion experience in soil, modeled at 100 times life size.

As an Exhibit Developer, I'm responsible for shaping the subject matter into an exhibit plan that communicates effectively with visitors. This involves content research and working with subject matter specialists to determine the scope of the content. It also involves working with designers and other exhibit professionals to come up with exhibit elements that are engaging and can communicate points clearly and concisely.

Most importantly, it involves developing a thorough knowledge of the visitors. Every exhibit weaves a content "story" of some sort. We don't know where to begin the story unless we know how much visitors know, or don't know, about a subject. So an Exhibit Developer's job is to create an exhibit story that builds a bridge between the visitor and the content.

How did you become interested in your field?

When I was a child, my two favorite places to go were Brookfield Zoo and the Field Museum. My parents took me to both places often, and those visits helped inspire my love of animals and nature.

After graduating from Purdue, where I studied biology and medical technology, I worked in a biochemistry research lab at Rush-Presbyterian-St. Luke's Medical Center. The problem-solving aspect of original research was exciting, and after a while, I wanted to try the challenge of my own research. So after a few years, I left Rush and returned to school to pursue a graduate degree in evolutionary biology.

At the University of Chicago, I studied animal behavior and ecology, with a special emphasis on mother and infant behavior in hoofed mammals. During this time, I developed several acquaintances at the Field Museum. Through them, I learned of a job opening with the exhibit team working on the renovation of the bird and mammal halls. I applied, and got the job.

Over the past eight years, I've come to realize how important informal science education experiences like museums are. I feel that I've finally found my niche.

What do you love about what you do?

It's exciting to me to have a job where I can keep learning new and fascinating things. I really love that part of it. Even though I'm a biologist working on biology exhibits, I never took a botany course, and so if I work on the plant hall, I'll learn a lot about botany and that will be valuable.

I also like interacting with a wide variety of people. In this job you get to interact with Ph.D. scientists, with artists, with a huge range of people, and I think that's neat. I've come to like the team process even though it's painful sometimes.

In my work I can come up with neat ideas but because I'm not an artist I can't visualize what I want very well. I think it is so cool to be able to articulate my ideas to someone and have them make it a reality through design and production. It's so amazing to get to the stage of the exhibit where these things that have been just ideas on paper suddenly have a reality to them.

And then to have a million people come and see the exhibit is really exciting. There's almost a child-like aspect to it--being able to dream dreams and have them become reality and then be able to share those. When I break my job down to its purest, most wonderful aspect, that's what it feels like to me.

How does conservation fit into your work and life?

I'm a fairly ardent conservationist. I've always had a feel for it but never looked at it politically until the last 5 or 6 years. When I first came to Exhibits I felt we were not supposed to have any advocacy for certain things. But I have evolved to a point where I think no, we *are* about advocacy, because if we as an institution are concerned with all

these different species of plants and animals and concerned about all these wonderfully diverse cultures, then we have to make sure they are preserved.

At the same time I see the importance of balance more than I used to. Conservation isn't going to work unless you meet everybody's needs and people aren't going to be inspired to conserve if all they have to do is give things up. But if they can see the benefits, then I think you can inspire people to conserve. Part of the problem is that a lot of the benefits are not immediate. So you have to educate people, but it's hard.

I really feel conservation is not a doomsday message, but more a matter of helping people understand how the Earth and science matter to them.

Are there ways gender issues have affected your career?

I have this theory of why so many women drop out of graduate school. I think it's because maybe women perceive more options. A man who gets on the Ph.D. track thinks, "What the heck would I do if I didn't get this Ph.D.?" A woman might recognize that there are plenty of other things she could do. I think women are better at having a rich life outside of work--their whole direction isn't wrapped up in that job.

There were careers I probably didn't even think of because I was a girl, and I do think I suffered from a feeling of inadequacy because I was a female--you know, that thing that seems to afflict a lot of women. But in some ways I think I'm doing what I'm doing because I did perceive more options that a man maybe wouldn't have.

Goals

What would you like to accomplish in your work?

I would like to see visitor studies incorporated more naturally into how the Museum operates. This means doing research on how well our exhibits and educational activities are working and on how to improve our effectiveness in communicating educational messages to visitors. Right now I think we do visitor studies in varying degrees in varying places. I'd like to see them done more consistently.

Beyond that, my goal is to inspire more people to go into science, especially girls. You know the studies showing how between the ages of 9 and 11 girls suddenly get much more introverted about participating in class and start to back off from math and science? I would like to get more involved in changing that.

Mentoring programs seem like a good idea to me. They give girls role models to follow and help them find ways to begin setting their own paths in science.

I think there also need to be more training opportunities--not formal schooling, but opportunities like internships. Working in science can be very different from science in school. I never liked lab classes in school, but I loved working in labs. Hands-on opportunities are ways for girls to evaluate a potential career and get a feel for a profession.

I think we also need to find ways to make it easier for women to stay in science. I feel in some ways I let myself be scared out of graduate school. It's not that I think I ended up in the wrong place, but it shouldn't have been the case that I got scared.

Research, publishing and getting tenure can consume one's life. But it doesn't have to be that way. People can have full outside lives and still be good scientists. But the system often makes it hard for them to do so. This can be particularly hard on women. Institutions that train and employ scientists can help by offering more flexibility in work situations, and by creating policies and advancement standards that are compatible with having a family.

Role Models

Did you have any role models when you were growing up?

I think my mom was a role model. She went to college in the '40s and studied accounting and was one of maybe two women in a huge class. She didn't work at that for very long--she stopped to raise a family--but the fact that she had done that and valued education and thought it was fine for women to work definitely affected my direction.

My parents were both into education. Never for a moment did I grow up thinking that I was going to get married and have kids and have that be the extent of what I would do.

Also my oldest sister was a role model in some ways. She's one of the reasons I ended up going into medical sciences. She's 15 years older than I am and she became a nurse. Everything she did was cool as far as I was concerned.

Advice

You don't have to know from day one in college what you're going to do for the rest of your life, or even day one in graduate school. I didn't. I clearly ended up someplace different.

And don't think you have to take a straight path. Try a lot of things. One thing I wish I had done more of is seeking out volunteer opportunities and internships and things like that, to get a better sense of what I did and did not want to do.

Another bit of advice would be to find a career that meets your needs. For instance, when I was in graduate school, one of the things I was reluctant about was that I recognized I didn't want to spend big chunks of every year in Africa doing fieldwork. But I could have fashioned what I studied so that it met my requirements. If I wanted to do fieldwork I probably could have found something to study locally.

So, don't be deterred by the mold. Recognize that you can make your own mold for what works for you. Think about what your requirements are and try to find something that meets them.

Janet Voight

Education: B.S., Iowa State University; Ph.D., University of Arizona

Came to Field Museum: 1990

Position: Associate curator and head of the Department of Zoology's invertebrates division

Career

What do you do at the Museum?

My research assesses distributional and evolutionary patterns of deep-sea animals, especially of octopuses.

How did you get interested in this field?

The end of my first year in graduate school I was kind of undecided about exactly what to do until I took a field course and started working on this little octopus. Suddenly everything went really well. As an undergraduate I had done independent research on small mammals, which gave me skills I could use to study the octopus, and I realized I had a lot of things to offer the field.

Working on this intertidal population of octopus, I got more interested in the group. In a parallel project, I examined morphological diversity of benthic (bottom-dwelling) octopuses and found that deep-sea octopuses have a predictable shape while the shape of shallow-water octopuses is variable. That began my interest in how these depth groups were related.

There are a lot of different types of octopuses. Some octopuses in the deep sea have fins and essentially live their whole lives in the water column; others that don't have fins but live suspended where the water is always dark, essentially just floating. Some live in the sunlit waters of the open ocean, swimming their entire lives. There are hundreds of

species of bottom-dwelling octopuses, which is what most people think of as an "octopus", although hardly anyone recognizes how many species there are.

Seeing specimens of deep-water octopuses made me want to see them alive, but there aren't many ways to do that. You can be on a trawl cruise, where you throw a net over the back of the ship and drag it along the bottom and pull it up, but the animals that come out are often the worse for wear. Or you can get in a submersible, and look out the window, or use a remotely operated vehicle (ROV) to see the animals on the TV monitor. I've been lucky enough to use all three of these methods.

How do you catch an octopus?

Most simply, you reach out and grab it.

What's it like when you're out at sea on a project?

On research ships, there's usually one goal that all the scientists share, whether it's to have successful dives with a submersible and bring as much back as possible, or to have the trawl go down and come up as many times and as full of stuff as you can.

Everybody focuses on that goal and getting the work done. There's no TV, there's no phone, there's no fax to speak of. Sometimes there's e-mail, but not that much. It's a bunch of people that get together and learn to work together. It's wonderful. I've been at sea for as little as ten days and as long as three weeks at a time.

Because once the ship is more than 100 miles off the coast, not even marine helicopters can reach it, the ship has to be completely self-sufficient. Sometimes that isolation contributes to the group working together really well. Other times things don't go so well and there are tensions. This makes it really hard because space on the ship is so limited that people are always in each others way. Depending on the size of the boat, there could be as few as 12 people or as many as 32 in the science party, with a comparable number of crew.

What do you love about what you do?

I love the sense of discovery, whether it's hydrothermal vents or figuring out if these two octopuses that look pretty much the same are really different species. The driving force is to see what's out there in the world, especially things that nobody's seen before.

Have you experienced any gender barriers over the course of your career?

When I came to the Museum in 1990 I was the fourth woman curator in the then 97-year history of the Museum. Since then I think the Museum has done well not only at equalizing things a bit, but in hiring the best scientists by bringing on board really good female anthropologists, a zoologist, our first female geology curator and a curator in botany.

It makes it easier not to be the only woman in a department meeting or in meetings of the entire curatorial staff. There was one luncheon the entire curatorial staff was invited to and I was wearing a powder blue jacket and all the guys were wearing their grays and their blacks and it was so obvious that I was the only woman.

Individually it doesn't mean I'm discriminated against, but it does matter. As time moves on, as individuals keep setting what hopefully are good examples, doing well, in time there will be more women.

Goals

What are your goals for your work?

One of the most important things is not only to see my own work progress but also to be part of an intellectually stimulating, strong, diverse community that shapes the entire discipline--that's what the Field Museum is at its best in everything it does. With the wealth of our collections, the specimen-based research in one area complements another.

Role Models

What kinds of barriers do you think exist for women in graduate school?

It may be harder for women because of a lack of role models, that is of someone who looks like them being acknowledged as an outstanding scientist or routinely being an essential part of a distinguished panel. Over time you get the subtle impression that only men are allowed to be these things. It may be easier for women to say, "Well, forget it. I'm not going to do this. It's a boy's game"

When you look at the statistics, there are still very few women who someone at my level can look up to as role models. That will change, but it will take a long time.

Do you see yourself as a role model for young women?

I might be, just because of my position. I've made it. I've gotten where I guess graduate students see themselves being in five or ten years. So maybe it's good that they can say, "Wow--look what Janet achieved. Girls can do it, too." I don't feel I've done anything really outstanding except to persevere.

Did you have any role models when you were growing up?

Women scientists? No, there weren't any women. When I got out of college I worked for a year as a lab tech. Then I got a better job as a research assistant at the University of Iowa Hospitals. That was the first time I knew a single woman who was a doctor, MD or

PhD, who made it into the system on her own merits. She was very supportive. She encouraged me to go to graduate school.

Advice

What advice would you have for a young person interested in science as a career?

They should understand that academic excellence requires a lot of dedication, unless you're extremely gifted. There is also a strong element of creativity in science that typically goes unrecognized. You have to be able to look at the world and envision ways that you can improve our knowledge of what you see. And, especially in biological sciences, it's not necessarily easy to get a job at the end.

I think it's important when you're going to school to periodically ask yourself, "Am I enjoying what I'm doing? Is this worthwhile? Or could I be something else, anything else, and be just as happy?" If the answer is "Yes, this is the best thing I could do," then continue.

Laura Torres

Born: **Zamora, Michoacan, Mexico**

Education: **B.S. Biology Universidad Michoacana; currently enrolled in a master's program at Northeastern Illinois University**

Came to Field Museum: **1994**

Position: **Collections Assistant, Vascular Plants, Department of Botany**

Career

What do you do at the Museum?

As the collections assistant I process and catalogue photographs of type specimens, assist in maintenance of museum's extensive plant collection and process incoming and outgoing herbarium loans, accessions and exchanges.

How did you become interested in your field?

When I was 12, my family moved from Michoacan to the San Joaquin Valley in California, where my dad was an agricultural worker. I enjoyed being surrounded by fields of watermelons, tomatoes, beans, and corn, as well as plantations of pecans, apricots, and almonds.

I also enjoyed fishing on the weekends and playing with the farm animals. These surroundings and the influence of a good biology teacher at my high school made me interested in biology. When I was 17, we moved back to Mexico, where I went to college and studied biology.

What do you love about what you do?

I love being in the fresh air and studying living things in their natural environment. In Michoacan, where I did my undergraduate thesis, while collecting plants and climbing the mountains I enjoyed seeing the different plant communities that changed with the altitude, from oak-pine to fir forest. Later, on Barro Colorado Island, Panama, where I did my master's thesis, I experienced the grandeur of the tropical rain forest for the first time.

Has being a woman made a difference in your career?

You have to be very competitive--being a biologist is hard. At the same time, you also want to be at home, being a mother. It's not a career where you go to your office and then you leave at 4:30 and go home. If you want to be in the field you have to decide which is more important and at which point you have to dedicate more time to your family

Goals

What would you like to accomplish through your work?

I would like to work in the tropics. I like taxonomy, the description of species, but I really like ecology, the interaction of species. I would like to be experienced in both of these areas of biology to be able to help in conservation. You have to know a lot about a species in order to protect it.

I think it's important to work with local people when trying to conserve the animals and plants they depend on. We need to understand that there has to be conservation for the future generations to be able to survive.

Advice

What advice would you give to a young person interested in conservation, science or exploration?

I think you have to be conscious that you have to give a lot more than you have to in other careers. It involves a lot more time, a lot more reading, a lot more being conscious of what you really like and how what you do is going to affect other people.

Mary Anne Rogers

Born: San Mateo, California

Education: B.A., M.A., University of California-Berkeley

Came to Field Museum: January 1983, as a volunteer

Position: Collection Manager, Fishes

Career

What do you do at the museum?

I take care of the fish collection. In general, this means I make sure specimens are preserved and stored properly. I correct problems as I see them such as poorly sealed jars of specimens in alcohol, insect infestations in skeletons, etc. I process and catalog new collections and integrate them into the existing collections, which currently consist of about 800,000 specimens. Another big part of my job involves serving the people who use the collection, either as visitors or as recipients of specimen loans.

How did you become interested in your field?

Ever since I was a kid I had a huge love for animals. This ultimately led me to study Zoology in college and grad school. I moved here after getting my M.A. and started volunteering at the Museum. In school I focused on mammals (my Master's degree focused on a Northern Great Basin species of pocket gopher) so my initial job here was in Mammals. But I've been in Fishes now for 10 years and I guess you'd have to say I like what I'm doing. I'd actually rather be back in California (my whole family is there), but one of the reasons I'm here is that I like my job.

What do you love about your work?

I like working with specimens and learning about fishes and the diversity of life. There are some amazing things in this collection. I also like organizing things. I like that there is a real variety in the tasks I do, so unless something is pressing I can pick and choose what to work on. I like the people I work with and I like the Museum.

Goals

What would you like to accomplish through your work?

My goals are to clean up the Fish Division and to be on top of things. Eventually I'd like to start devoting some of my free time to mammal research again.

Someday, when I make it back to California, I'd like to devote at least some of my time to more conservation-related projects. Working to help reclaim California wetlands interests me and I'm also startled by and concerned about over-fishing in the fishing industry. As vast as the oceans and their fauna may seem, some fish populations are being depleted.

Other

species are being caught and killed unnecessarily in the process of bringing in species that are targeted for human consumption.

Role Models

Did you have any role models growing up?

I can think of a couple of role models. Jane Goodall was a big one for me when I first got interested in pursuing Biology as a career. She really inspired me. Once I was in college I was lucky enough to be surrounded by many excellent, hard working biologists. My major professor, Jim Patton, especially comes to mind out of this group of people. He instilled in me a tremendous work ethic and set quality standards for me that I'll carry with me forever.

Do you see yourself as a role model?

I like to see myself as an example of someone having a biology career in a discipline people don't usually think of. I like to show parents and their kids that if you want to study biology or science, in general, becoming a doctor or a teacher aren't the only options.

Advice

What advice would you give to a young person interested in a career in science?

Study what's enjoyable to you and don't worry about getting a job in the end. While it's a good idea to think about a future career, if you can become qualified to do something you really enjoy, you might be lucky enough to be paid to do that someday, instead of being stuck with a job that just brings in a paycheck.

I was lucky and had no parental pressure to do anything in particular in college, so I was able to follow my interests, but many people I knew felt pressure to live up to their parents expectations.

In other words, follow your own interests. Study what you want. It's a mistake to think you can take only one path, too. Interests change and so do your needs. Don't give in to

the pressure of parents, teachers, and advisors. Don't feel that you owe them something; it's your career and your life.

Margaret Thayer

Born: California (raised in Massachusetts)

Education: Sc.B., Brown University; Ph.D., Harvard University

Came to Field Museum: 1985

Position: Adjunct Curator, Insects, Department of Zoology

Career

What do you do at the Museum?

I've got my fingers in a number of different pies, but they nearly all involve research on rove beetles -- the family Staphylinidae. It's one of the biggest families of beetles in the world, with more than 45,000 species described so far. I also help care for the insect collection, advise students, and participate in some educational programs and exhibit development.

I've worked for a number of years on one group of rove beetle subfamilies, trying to understand their systematics and the evolutionary relationships among them. I'm particularly interested in the ones that live near the southern end of the world, in Australia, New Zealand, southern South America, and, to a lesser extent, South Africa.

There's still lots of basic information lacking about the rove beetles down there (and many genera and species new to science waiting to be described). My overall aim is to look at individual genera, analyze the relationships within each genus, see what patterns of biogeographical relationships they show, and compare these patterns to those of other rove beetles, animals, and plants to explore the evolution of southern biotas.

I'm also interested in the evolution of rove beetles more generally, including how feeding habits have changed within the family as different subgroups of them evolved. There are enough unanswered questions to keep me and other workers busy for a long time!

How did you get interested in your field?

My father, though he was a biochemist by training, had a life-long interest in natural history, picked up from his parents. My mother also enjoys the outdoors, and learned a lot about edible plants and berries from her mother. When I was growing up, we went camping and walked in the woods locally and things like that, and I got interested in the natural world.

By the time I started college, I'd been interested in biology for many years, but hadn't narrowed down my interests enough to choose a career path. I started learning a little about insects my senior year, after hearing about the entomology course a friend at

Harvard took there. After graduating, I looked for a job and wound up working in the entomology department of the Museum of Comparative Zoology at Harvard, mounting and labeling little tiny beetles that lived in fungi.

When I heard of the museum job, it sounded like a nice chance to learn more about insects and see if that was the direction I wanted to go. Within two weeks, I was hooked on beetles for life! I worked my way up for about seven years there, simultaneously learning about entomology and starting to do my own research on beetles. Then I became a graduate student at Harvard and finished my Ph.D. five years later.

What do you love about what you do?

I love the chance to discover new information and investigate new places; the latter means fieldwork. One thing you simply can't do by looking at specimens in the museum is find out what different beetles do for a living, or exactly where they are in their habitat, or things like that. Sometimes you can get a little of this kind of information from museum specimens, but you really have to get out in the field to explore in detail.

An exciting discovery I made in the field concerned a very odd rove beetle from Chile and Argentina. It's a really strange looking one, very anomalous for the family, but many features make it clearly a rove beetle. Only a few specimens were in museums, and absolutely nothing was known about its biology -- I wanted to figure out what it does.

While in the field in Chile, I found some of these beetles on the underside of a leaf as it was getting dark one day. It turned out there were a lot of them on the vegetation. That's pretty strange for rove beetles, since most of them live in leaf litter, on fungi, under the bark of logs, or places like that.

We preserved some, and later I studied the specimens under the microscope. In their guts I found numerous fungal spores and tiny fungi that grow on leaves. Evidently these beetles walk around on the leaves and scrape off little fungi with their mouthparts, which seem to be specialized for doing so. This is a really different way of life from other rove beetles, most of which are predators. The adults look very different from what seem to be their closest relatives, and probably have been evolving separately from those for a long time. I still don't know how they came to look as they do or what their larvae look like or feed on.

Without fieldwork and the chance to see, collect, and study all those specimens, I couldn't have figured out much of anything about this species' biology. At the same time, I also enjoy using a variety of high-tech tools like computers, microscopes, and the scanning electron microscope to learn more about "my" beetles and to publish my findings and share information with others.

Have you ever encountered any gender barriers over the course of your career?

Not obvious ones. I was lucky enough to have a very supportive family: I don't remember my parents ever suggesting there was anything I couldn't do just because I was a girl (and that was in the 1950s and '60s). For example, when I was four, lightning hit our chimney and some firemen came to check it out. For the next year or two, I wanted to be a fireman, and

nobody ever told me I couldn't even though there were few, if any, female firefighters in 1956. My parents always encouraged me to pursue whatever career I wanted. This probably helped me go ahead in science in, say, junior high and high school, and not worry about being unusual. My high school physics teacher very consciously encouraged my interest in biology and in science in general. My husband, also an entomologist here at the Field Museum, has always supported my research interests very strongly.

What gender issues do you see in science in general?

Women are certainly still drastically underrepresented in science. I think various factors have contributed to this situation, from social pressure against girls getting into science at all, to career path norms in science that are difficult to reconcile with child-bearing and rearing, to

lingering prejudices about women's commitment and/or ability to "do science." These pressures are being re-examined in many places, though, and things are changing. The gender imbalance is very strong in entomology, and even more so in the areas of entomology I work in, systematics and evolutionary studies. Gradually, though, there are more women being trained in these fields, too.

Goals

What do you hope to accomplish in your work?

My long-term goal is to continue working on the evolution of the family Staphylinidae as a whole, and also to get a better overview of evolution within the subgroup I've been focusing on, to figure out more about its historical biogeography, or how the present distribution of the beetles evolved.

I'm interested not just in how these particular beetles got to where they are, and how they diversified, but also how their patterns fit in with how and where other groups of organisms were evolving at the same time. The larger question is: Do these different groups show common patterns, suggesting evolution of a whole biota, rather than just independent evolution of each particular group?

Tell me about the projects you're involved with?

Besides the long-term work I mentioned, I've recently been collaborating on a large book chapter that will be the first guide for identifying all the more than 500 genera of staphylinid beetles found in North America. That's been a big project. And I'm also working with colleagues in the US and Mexico to do a similar book on rove beetles of Mexico, a guide to identification of the genera. There's never been anything like that for the Mexican staphylinid fauna.

Locally, I've been involved in two projects with ECP (Environmental and Conservation Programs). We're trying to develop rapid assessment procedures for gauging habitat quality and type using different kinds of organisms. We're also studying the effects of restoration work in a woodland area in the Palos Hills. After a controlled burn in half our sites, we'll continue monitoring for a variety of different plant and animal groups, and also mushrooms, to see what sorts of changes occur as the habitat changes.

I'm also involved in a project that's part of the Integrated Taxonomic Information System (ITIS), a multi-agency project of the US federal government with collaborators at many institutions. I'm coordinating the collection of beetle data for this database. The initial goal of the database is providing on the World Wide Web a list of all the species of organisms known in North America and other U.S. territories and possessions. It's not known for sure how many beetles that is -- about 25,000 are known from North America alone.

Role Models

Any role models growing up?

Seeing or knowing active women scientists, no. I had one or two good female science teachers, and I suppose that at least showed me some women who knew something about science. Knowing that my maternal grandmother had been very interested in chemistry (but lacked any opportunity for higher education) may have made an interest in science seem normal for a girl, too.

Advice

What advice would you give to a young person interested in exploration through science or entomology?

A career in scientific research can be very exciting and rewarding, but it takes a lot of hard work, and most scientists don't get rich. Whatever field you enter, get a broad background to enhance your specific interests. I think it has been a real plus for me that I was trained in biology departments and saw entomology as a part of biology.

To young women in particular, I'd say: If you're interested, go for it, and don't be discouraged easily. If you encounter barriers you think are gender-based, try to explore, expose, and work around them in a constructive way. Keep your eye on your goals.

Meenakshi Wadhwa

Born: Bombay, India

Education: B.S., M.S., Panjab University; Ph.D., Washington University

Came to Field Museum: 1995

Position: Assistant Curator, Meteoritics, Department of Geology

Career

What do you do at the museum?

I study a variety of meteorite groups, ranging from those originating on asteroids to those of Martian origin. The goal of my research is to decipher the processes involved in the meteorites' formation using trace element distributions in their minerals and also to determine when they were formed. From this I hope to learn more about how our solar system, and the planets and asteroids within it, were formed. My other responsibilities at the museum involve helping to define the scientific content of exhibits, and public education and outreach activities.

How did you get started in this field?

I've always been interested in the sciences. I enjoy physics and chemistry and biology, but what particularly interested me about the science of geology is that it is interdisciplinary, in the sense of trying to understand the workings of the earth and other planets through applying other sciences. I enjoy the field work, too. Being able to travel all over is definitely one of the things that first drew me to geology.

Once I had my master's degree I decided to get a Ph.D. in planetary sciences because I felt I would be limiting myself by just learning about the Earth. There are other planets out there and Earth is one component of the solar system. People tend to view meteorite studies as something independent of Earth studies, but that's really not the case. Most of what we know about the beginnings of the Earth and how old it is and what it's made of comes from studying meteorites.

Where do you find the materials that you study?

Meteorites have been falling to Earth throughout its history, so there are specimens that have been in collections for a long time. The Field Museum has one of the best collections of meteorites.

In the last three years or so, there have been active meteorite collection expeditions to areas like Antarctica and the desert regions of Australia and Africa, places where there's not much vegetation to camouflage a dark rock. Antarctica has been one of the most productive places for collecting meteorites in the last 20 years. There have been over

15,000 meteorites found there by U.S. and other international teams in the last two decades.

Antarctica is special. Not only is it easy to spot meteorites, but there is also a conveyor-belt like mechanism that concentrates meteorites in certain regions on the ice. As thick ice sheets are moving gravitationally toward the coastline, meteorites that have fallen on these ice sheets get carried along until they come up against either a mountain range or some sub-surface obstruction, and the ice starts moving upward. The high-velocity ('katabatic') winds in the Antarctic ablate the surface of this upward moving ice and meteorites reemerge in these zones. You can find hundreds of meteorites concentrated in some of these areas. It's just amazing.

What do you love about what you do?

I love the sense of discovery, of learning something new about our very beginnings.

A lot of people may think that research in the pure sciences, which appears to have no direct applicability, is not as valuable, but I think it is the ability to ask and to attempt to answer these very basic questions that makes us human. Where did we come from? How old is the universe? How old is our solar system? How did the earth and our solar system form?

We have an amazing amount of information about events that are so distant in the past—something like 4.5 billion years ago—it's incomprehensible to most human beings. But we have a fairly decent idea of how the solar system formed and how the elements formed that comprise you and me and everything else in the whole world. It's knowledge, and I find it very exciting. That's what I find really fascinating about my job.

Another thing I like is the educational component, which is rather different from that in university-type jobs. I participate in educating the general public (not just college-going students, but the entire cross section of society) about what we're doing and why it's important and interesting. Most of our research funding comes from taxpayer dollars, so it's important to show the people walking in the door here that their money is being well spent and that the work is worth doing.

Have you ever experienced any barriers in your career because you're a woman?

I have to say that I have not. Although in India, when I first expressed interest in going into geology, I encountered some skepticism because it was an all-male faculty in the department of geology at Panjab University and 18 of the 20 incoming students in my class were men. The general concern was regarding how I would cope with the strenuous field work and how I would manage in such a male-dominated environment. I think that was the only time that I encountered that skepticism.

I think it's definitely getting better than it used to be. When I go to conferences now, I see a lot more women than when I started out 8 years ago. Maybe 20 years from now, it won't even be an issue.

My Ph.D. advisor at Washington University was a woman. She was a rarity in her generation, and I was lucky to have her as my advisor. She made sure that everything that came out of the lab was the highest quality. She was always rigorous about that. She played a big role in shaping my scientific approach to things.

She had to make some hard choices when she started her career in the '60s. There was no way she could have children and also have a career in this area. Fortunately I don't think I will ever be faced with that choice, but for her it was definitely the case. I don't think she would have been tenured in her department if she'd shown any distraction from her career. That was unfortunate, but things are changing.

Goals

What kinds of scientific advances would you like to make?

I'm looking forward to when we have samples, actual rocks from other planets, brought back from spacecraft missions. That's going to happen--from Mars--in the next 10 years. I'm looking forward to holding pieces of other planets in my hand and being able to analyze them so I can tell exactly how old they are, what they're made of and how they formed.

I'm currently involved in establishing a laboratory here, a state-of-the-art geochronology laboratory for age-dating samples. The Field Museum will be at the forefront of such studies, so when we get samples back from other planetary bodies, we're going to be able to analyze them here.

Role Models

Did you have any other role models when you were growing up?

I wouldn't say role models, but my parents were always very supportive. Many parents, in India especially, have a different attitude toward their girls and different expectations of them than they do of boys.

My parents encouraged my sister and me to do what we wanted to do. In India that's a big thing. Even in very educated families there is an expectation that once you graduate from college you get married and have kids. Even today that's very prevalent. My parents were not that way and I think that made a difference. Also, many Indian parents would not have let their daughter go off so far away to graduate school.

Do you see yourself as a role model?

I think yes, in some ways, just from being in this position and having the opportunity to interact with people through Museum events like Members' Night and public-outreach talks and seminars. If I can be a positive influence on even a small percentage of the young women that I interact with, if I can boost their self-confidence, make them feel that science is nothing to be afraid of but can be an immense amount of fun, I would feel very gratified indeed.

Advice

What advice would you have for a young person interested in science?

Just follow through on your interests and try not to care about peer pressure and things like that that usually distract kids. Try to keep up with the math and science. Math is definitely very important. A lot of kids hate it, but if you honestly apply even a moderate amount of effort, it's not very difficult at all.

I'm a case in point. Through 4th or 5th grade I was awful in math. I was really scared of it and I hated it. My dad, who majored in math in college, said, "Let me sit down and spend some time with you." And we started from the very basic things and worked our way up. All it took was somebody that I wasn't afraid to ask questions for fear of looking stupid and who helped me do it right. That's what took care of it. It wasn't that difficult.

So my advice would be to not worry about looking "geeky" or get distracted by people who think it's uncool in some way. It's not uncool. There are lots of neat things going on, and there are going to be great opportunities in the future, and proficiency in science and math will be key. There will hopefully be manned missions to other planetary bodies in the not-too-distant future; I'm envious of somebody who's in their teens now and may some day have the opportunity of exploring other planets firsthand.

Nancy Hensold

Born: Park Forest, Illinois; raised from age 2 in Olympia Fields, Illinois

Education: B.S., Michigan State University, 1978; Ph.D., University of Michigan at Ann Arbor, 1986

Came to Field Museum: 1990

Position: Tropical Collections Specialist, Phanerogams, Department of Botany

Career

What do you do at the museum?

I identify northern Peruvian plants, curate the South American plant collections, and do taxonomic research on the family Eriocaulaceae.

How did you become interested in your field?

When I was young I really wanted to be an artist or an actress. I was not the sciency little child. Some kids are really sciency from a young age and I wasn't.

I got interested in botany when I was a flower child in high school. I liked the structure of plants, the way they looked. They seemed like such pure, otherworldly beings. My grandparents were farmers--quiet, hard-working people who didn't believe in calling attention to yourself. And I saw plants that way - just by growing silently, being themselves, they provided food for the entire world, made all life possible. I liked that image.

I also loved the outdoors. My dad took us wilderness camping every summer and always made everything feel like a big adventure. When I went to college, I liked the botany classes where we'd go outside and wander around in the woods, not knowing what we'd find.

I settled on plant taxonomy right away, the field where you classify plants into species, and natural groupings of species. To me it makes the world seem like a richer place, and it's a way of honoring living things.

Has being a woman made a difference in your career?

I think it always makes some difference being a minority. Academic science for most of its history has been an almost exclusively male institution, and museum science is still one of the most male-dominated disciplines. But I'd be lying if I didn't admit that was part of the attraction for me. Only later did I realize that there was a down side, that even really good men can have difficulty relating to women, and vice versa.

But on the positive side, being an outsider can sometimes help you see things with greater clarity. For example, science can be really competitive rather than cooperative, which is often wasteful and counterproductive. Scientists are sometimes obsessed with demonstrating to each other the hardness of their methods or the power of their techniques, to the point that they get distracted from what matters.

I have kept a low profile, professionally, in order to stay away from the politics and competitive pressures. I've never even applied for a Ph.D.-level position. But as far as how I've been treated by people personally, I think I've been treated well, judged by the quality of my work, and given freedom and respect. I'm kind of a hermit and that probably helps.

How does gender affect other aspects of science?

One of the annoying things to me is that we're not allowed to say that there is any art in what we do because that seems to trivialize it. There's this annoying machismo about how hard it's supposed to be to know the truth--This is rigorous. We're doing something hard. We're stripping away the illusion from the truth.

I think it relates to the idea of physics envy. Within the sciences you go from hard to soft science-talk about masculine and feminine! Hard science is physics. You go from mathematics to physics to chemistry to molecular biology to biology to organismal biology. And then you get up into ecology and, God forbid, psychology and sociology, which are barely considered sciences. It's called physics envy. It's like everyone is trying to reaffirm their identification with physics and chemistry. Right now we have this drive to analyze DNA, as if we don't really know what something is until we know what its DNA looks like. We can't say we know anything until we know that. And this is such a masculine single-focus kind of thing.

Goals

What would you like to accomplish through your work?

In spirit, what I really hope to accomplish is to make plants visible to people. There are thousands of different forms of life but there, all with different needs and different capabilities, just like people, and they need to be understood and acknowledged.

I think most people don't realize how poorly we know the plants on earth. There are many tropical plant families, for example, which no one in the world knows how to classify into species. We have cases of specimens with only a genus name on them, and we don't know how many species there are, how to tell them apart, what their distribution is, or how threatened they are with extinction.

It isn't easy to come up with this information. It can take weeks or months of studying specimens before you begin to see the faces of the individual species emerge. It's a visual kind of learning, and it's so satisfying when it happens---it's like watching the skyline of a city appear through the fog. Once you see the species, you can usually explain to other people how to see them, and you can begin to learn something about them and hopefully care for them.

People often have a misconception that what we taxonomists do is just slap names on things--that we have this neat, pre-existing system for sorting things into pigeonholes, and that's what we do all day. But the reality is that living things have their own system of order, and we have to be very attentive and patient to see it. So, yes, part of what I do is simply identify plants using other people's published work, but another part is the original work of trying to see the faces of the species for the first time.

How does that all fit into the greater conservation issue? Is there a race to identify things quickly?

I feel that actually, especially in the tropics, we have very little influence. Doing the descriptive work and the inventory work is not going to stop people from destroying those habitats. We're talking about political issues and land-reform issues and whether the people have a way to make a living. I think what I do helps incidentally, but if I were to go out and commit my life to conservation, I'd have to try to influence people who are not botanists, and think in dollars. Not too many of us are doing that.

Role Models

Who were your role models growing up?

In about fifth grade, my role model was James Bond. I read all Ian Fleming's books. I loved the sense of mystery, the dark alleys and secret codes.

There's one role-model figure of the 20th century that has no female version and that bothers me: the brilliant absent-minded professor. Like Albert Einstein. Woman scientists on TV and in fiction are never spacy or goofy or warm-hearted. The absent-minded professor is an inspired visionary with a sense of humble perspective, and you never see that figure portrayed in female form.

The brilliant and eccentric women in science are the ones most likely to be misunderstood. It's like you have to be tough as nails and intimidating all the time or nobody will take you seriously.

Did anyone else influence or inspire you?

I had this biology teacher in high school who was from Iowa. For some reason I always ended up with mentors from Iowa. They were just very dry and non-threatening, these guys with their brown suits on, talking about plants. I liked them. They were easy to connect with.

Advice

What advice would you give to a young person interested in conservation, science, or exploration?

I think a lot of people have a romantic, "Star Trek" image of science, which is not real. When I was in high school, I thought scientists were more down-to-earth, more reasonable, more trustworthy, and less egotistical than other people. I thought the people on nature programs were really saving the world. None of that is necessarily true.

So to those romantic types, like me, I would advise: Focus on what you want to do, rather than what you want to be. Go out and get as detailed a picture as you can of what scientists do, and why, and if it seems really important to you in your heart to do those things, then go for it.

Are there any changes you'd like to see in your field?

I've noticed that botanical art such as Margaret Mee did is considered in modern industrialized countries like the United States not to be part of science. Serious scientists always hire professional illustrators to draw their new species. If you do your own drawings you're considered an eccentric. Science and art are treated as two separate, even contradictory, spheres.

But in India and Latin America and the third world, many botanists do their own illustrations. They consider drawing a tool for training their eyes to see what's there. And I think that's right.

Not only that, but illustrations are the best and most effective way to communicate the visual knowledge that results from taxonomic study. One thing I think is strange is that a paragraph description in Latin is required if anyone wants to publish a new plant species. This is somehow supposed to make the information universally accessible, even though no one speaks Latin anymore, and even though these descriptions are often only a few lines long.

As far as I know, no one has ever proposed a requirement to provide a line drawing of the new species, even though it would be much more useful and universally understood. I think that says something about how alienated science and art are in the modern world.

Petra Sierwald

Born: Hamburg, Germany

Education: B.S. (non-applicable); M.S, University of Hamburg, 1982 (Biology, Geography and Biology Education); Ph.D. University of Hamburg, Zoology, with a thesis on African nursery-web spiders, 1985

Came to Field Museum: 1990

Current position: Adjunct Curator, Division of Insects

Career

What do you do at the museum?

My position as a curator comprises three quite different fields in the realm of research and education. In my research I focus on the bio-diversity and evolution of spiders and millipedes, and I conduct investigations into their behavior and ecological role. This research is driven alone by my curiosity and interests.

By following my interests, I acquire an extensive knowledge in various details of spider and millipede species. This knowledge is put to use in various ways. I assist in the development of exhibits. When you come to the Field Museum our curators and exhibit developers stand behind every label in our exhibits. I also participate in the development of educational material for schools. Book publishers request that I review texts dealing with spiders and millipedes; it may be that I reviewed sections in a schoolbook you use.

The third area of my work concerns the maintenance and growth of our specimen collections. The collections provide the base for current and future research in conservation, bio-diversity, ecology and evolution. Scientific research collections can be used by any researcher anywhere worldwide. Parts of Field Museum's material are shipped to various countries where researchers use the specimens to follow their interest and to answer ecological and evolutionary questions regarding the organisms in their countries.

What do you love about your work in your position?

It is especially the combination of these three areas that I cherish about my position. The Field Museum is one of the very few large research museums in the world. As such, it offers the extremely rare opportunity to "curiosity-driven" basic research into the diversity of living organisms.

Selection of research topics does not have to be rationalized by immediate economic goals or profits. This means that researchers are free to follow their individual interests and use their unique thinking patterns when investigating a scientific problem. This type of research has always been rare and sparsely funded. In the past such research was considered 'gentlemen-science': only persons of independent wealth were able to pursue it.

I deeply enjoy using my scientific expertise for exhibit development, educational, and environmental programs. It is very important to me that knowledge can be placed into the service of others.

The collections I help to build and maintain have been gathered by numerous scientists and amateurs before me and will serve long after new researchers and new research

techniques will come along. Due to our worldwide loan traffic I am in constant contact with researchers in many other countries. This provides me with a very stimulating interaction across political and cultural barriers.

Do you see any ways that your work fits in with conservation?

All monographic work describing species forms the basis for conservation. We can't protect when we don't know what we have. For example, my work on African and Asian fishing spider described all known species in detail so that they can be correctly identified. Also, species new to science are described. Any conservation effort must be based on a clear understanding of species diversity and species richness of a particular place.

I use my knowledge on spiders and millipedes to participate in ecological studies conducted by Field Museum's Environmental and Conservation Program. By determining which and how many different spider and millipede species live a various prairie remnants around Chicago, I hope to help in restoration projects. A well-preserved and well-organized collection of identified specimens captures species distribution from different times.

Research on such specimen collections facilitates discovering changes in species composition. By building and improving existing collections I facilitate such future research.

Have gender differences affected the path of your career?

Absolutely yes. From as long as I can remember I was interested in science and was leaning towards physics and chemistry as fields of study. But when I grew up, biology was the only science that was considered acceptable for a woman. In 7th grade, our mathematics teacher commented about the uselessness of us girls learning mathematics, since "you will marry anyway." Our complaint about this statement at our female homeroom teacher was not well received.

Have you experienced barriers based on gender?

When I was asked the same question several years ago in a survey conducted by a German academic funding agency for gifted pre-doctoral students, I reflected on my past experiences in this regard. My memories consist of small anecdotes and comments, some of them hilariously ridiculous, from parents, grandparents, aunts and uncles, teachers, professors, and the next door neighbor. A biology professor at my alma mater seriously suggested that I had to be a militant feminist and man-hater, because I studied spiders ("because all spiders kill their mates"). For the record: he was not a systematist, and most spiders do not kill their mates. I dare to suggest that part of my perseverance was to prove them wrong. Although I grew up in Europe where conditions may have been and are different from the States, inferring from reruns in American television we all grew up

under severely restricting gender stereotypes. Cultural programs and the arts, most works of world literature we all studied in school, were and still are written from a male perspective. Major events in what is still considered "women's world" were not, and are not featured to an equal extent, and are not adequately addressed in the professional world (Note that family issues are treated in the Sunday edition of the Chicago Tribune in a section called "WOMANEWS). Since mothers still carry the main burden of child care, the issues around parenthood become the most significant problems for women when advancing their careers. A very recent quote from a successful (and still fairly young) female biologist: "I would not have this position if I would have had children."

Do you think that the situation is going to change?

Past and present gender stereotypes do not affect women alone. Men are similarly trapped, but in a different stereotype. In addition, current economic conditions influence the working conditions of scientists in the basic, non-applied life sciences in a unique way. The most pronounced feature in my experience is the difficulty to arrange family life with a scientific career path. My comments in this regard are not to be viewed as a comprehensive analysis of all factors, but I would like to highlight a few I found to be influencing my personal path.

The education for a Ph.D. level scientist is one of the longest time spans during which virtually no personal income can be realized. In addition, starting salaries in the basic life science field are alarmingly low. As a result, both male and female scientists are rarely parents, or become parents very late in life. Ph.D.-level research positions are very rare, and the number of positions has actually decreased in the past five years. In addition, colleges and universities (at least in urban areas) offer an increasing number of extremely low-paid, part-time positions with absolutely no benefits (while still charging parents and student full tuition). This practice has been reviewed in the press recently. Such positions do not help a Ph.D.-level researcher while waiting for one of the few research positions to open. Thus, the path to a research position becomes even harder to travel. Biologically, women simply cannot wait as long as males and the number of female scientists who are also mothers will not increase before these conditions change.

It is most likely not intentional discrimination that shapes the current gender make-up of research scientists and the under-representation of parents, especially of mothers, in the field. The persistence of working conditions, attitudes, and inflexibility that originated before women ever entered research science careers, combined with low starting salaries after too long an education period cause a selection against the "family-scientist."

Goals

What are your short- and long-term professional goals?

I have different professional short-term and long-term goals relating to the three main areas of my work. In the research area I have just begun a new large endeavor, funded by a five-year National Science Foundation Grant. Millipedes are seriously understudied, there are only very few experts left in the world. Yet millipedes are very important decomposers of leaf litter in our forests. The main literature on this group was published at the beginning of this century in languages other than English. Millipede collections in various museums are without curators and are not being used. One of my tasks is to improve the situation, to produce monographs, catalogues on the various species, and identification keys, so that future researchers will be inclined to choose millipedes as their research topic. Under this grant I am training new experts in millipede biology and systematics. I also wish to continue my research on the evolutionary history of the nursery-web spiders of Africa and South-East Asia and research into the different mating strategies of widow spiders. Such research may actually help us understand one of the main mysteries of life on this planet, the origin of species.

One of my long-term goals (better called dreams?) for my participation in educational programs is to improve the status of education in the eyes of the public. I have heard comments like "oh, it doesn't need to be that accurate, it is for elementary school children" too often. I happen to believe that children are the most intelligent members of the human race and to teach them anything less than the most accurate data is unacceptable. I also wish I could help to spread the notion that increased knowledge reduces fear and stress. If you know the spiders in your house, you know there is nothing to be afraid of. Knowing more enriches one's life experiences dramatically. My participation in exhibit program is guided by such goals.

Role Models

Did you have a role model when you were growing up?

My personal experience with role models at a young age was mainly influenced by the realization that women were (at least at that time) severely hindered in their personal development. My grandmother for example was an excellent scientific illustrator and naturalist. She never received any acknowledgement from the male members of my family, on the contrary, her impressive faunistic and floristic knowledge was often belittled. I realized as a very young girl how much my grandmother lost in life. Nevertheless, my grandmother was the one who turned my interest to biology.

Any current role models?

During my lifetime, I have seen a substantial increase in the number of women in science as well as in leading positions in other fields. However, women adopted standards and attitudes of the existing system they found when entering these positions. As a result, working conditions and attitudes have not changed to a substantial degree (e.g., flexibility regarding working hours, bringing children to the workplace even on rare occasions is still almost impossible). Since professional women still adopt existing attitudes and standards, a "sisterly" solidarity, although often wished for, is seldom practiced. If at all,

women seek individual solutions that fit their particular situation rather than searching for new modes that will benefit a larger group of people. Thus, women should not be surprised to experience discriminatory attitudes towards them from males and females alike.

Do you see yourself as a role model?

I am certainly asked occasionally to serve as a role model (e.g., during participation in Field Museum programs). I have received questions from women regarding science as a career and the problems it brings to parenthood. It would be very satisfying to me if I can help to promote some changes in the working conditions that currently restrict the number of women and parents in science careers.

Advice

Being the mother of a daughter I am faced almost daily with the task of advising for the future. Gender stereotypes are still alive and well in American schools today: an assertive girl in jeans is viewed with suspicion and accused of "challenging authority," while distinctly disruptive behavior in boys is tolerated under the alleged wisdom that boys will be boys.

Since we are not born into the future (when things will be better?), we have to live in the here and now.

It is imperative to be alert of gender stereotypes. It is also important to face the fact that women who made it are not necessarily more sympathetic to female issues. Currently, the situation of mothers is still the most vulnerable; in all industrialized nations the income of mothers lags far behind the income of men and childless women. According to news media reports, this trend is not likely to change anytime soon.

If you feel drawn to science and research, by all means, go for it. You will need math, at least one foreign language and a good general education. But most of all, you will need to be willing to work for years without any or very low pay and to work more than 8 hours a day and more than 5 days a week. To be successful in such a career the joy of the research must make up for a lot of inconveniences. To stretch ones thinking and to go with your brain where truly nobody has been before is exhilarating (almost addictive) and can be extremely rewarding. Combining a research career with motherhood will make you more vulnerable, especially since motherhood does not earn you any points. On the contrary, mothers are sometimes viewed with suspicion, as if giving birth would somehow be hazardous to your intelligence.

Qiuxin Wu

Born: China, province of Jilin

Education: B.S., Northeastern Forestry University; M.S., Institute of Microbiology, Chinese Academy of Sciences; Ph.D., University of Tennessee

Came to Field Museum: 1991

Position: Collections Manager for Mycology in the Department of Botany

Career

What do you do at the museum?

I am the collections manager for mycology in the department of botany. The museum has a strong collection of fungi, especially mushroom groups, and I was hired to take care of those collections as well as to conduct mycology research. I am active in a joint research project between China and the United States that is looking at fungal species found in both of those countries but nowhere else in the world. The project's goals include collecting baseline information useful for maintaining forest ecosystems and new insights into biogeographic relationships.

How did you become interested in your field?

Before I went to college, I was influenced by stories I heard on radio and TV about skillful scientists using their knowledge to cure plant diseases and so to benefit agriculture and forestry. I thought that was the kind of job I'd like to do--to save crops and trees and to benefit society.

After an admission test, I was accepted by a university with a strong program in plant pathology and forest protection. During my college studies, I became interested in fungi--organisms that play important roles in ecosystems.

What do you love about what you do?

I love to join the effort of understanding the roles of fungi in maintaining a healthy environment. My current research interests are fungal biodiversity and biogeography. Biodiversity is concerned with species richness and frequency in an ecosystem. Biogeography is about distribution patterns of organisms through time, ecological changes, and evolution. These are the fundamental issues that affect conservation efforts.

In addition, fungi play very important roles in nature. They have three major functions: as a decomposer, recycling nutrients; as an essential partner in helping plants grow; and as a parasite of plants, animals and humans. Because of those important functions, we need to discover how the biodiversity of fungi is related to the health of the ecosystem.

Why is conservation important to the world in general?

I think there is a reason for everything to exist in the world, and some of the reasons we do not know yet. We know very little about what constitutes a harmonious environment and how species are interacting with each other. Unless we preserve these species, we won't have a chance to know. Some species have disappeared before we learn what benefit they have for the environment.

Conservation is a global issue. It requires understanding and effort of different people and cultures. We have to treat each other as equal humans, above and beyond gender issues and cultural issues, and work together to preserve the Earth.

What does conservation mean to you personally?

In my travels, I have seen some short-sighted things that humans have done to the environment, like massively clear-cut forests. After the forests are gone, the root system deteriorates. There is very little to hold the soil and water; when it rains, floods form and the good soil floats away. Eventually, the land is lost even for agriculture. With agriculture gone, the food supply for humans becomes a problem. Preserving the environment is important not just for the future, but also immediately good for humans.

Has being a woman made a difference in your career?

I don't think of myself as a woman when I work. I really don't. I do the same thing as men do and I use the same standards as men to evaluate myself. I would like to be treated equally--with respect--as a human being, not as a woman. In reality, there are some disadvantages to being a woman in science and conservation, just as there are in other areas of society. We often have to work harder, try harder, and overcome more in order to earn professional respect.

Goals

What would you like to accomplish through your work?

In the short term, I would like to document fungal biodiversity in a specific temperate forest, and to answer particular questions about biogeographic relationships of fungal populations. In the long term, I would like to look in-depth at the roles of fungi in solving certain environmental problems.

Role Models

Who were your role models growing up?

I didn't have a particular role model. My ideal is more like someone who brings great changes to society to improve the quality of human lives. I would like to see that my life is not just a passive survival on Earth, but a positive contribution to humanity. If you cannot do big things, then you do small but good things.

Advice

What advice would you give to a young person interested in conservation, science, or exploration?

Choose wisely what you do and do it well. Conservation, science, and exploration are great fields for women with passion and determination. Life is definitely a growing experience. You have to learn things every day to become stronger. I pay my highest respect to women who are good at what they do and meanwhile maintain their femininity.

Shannon Hackett

Born: British Columbia, Canada

Education: B.S. , University of Victoria, Canada; M.S., Ph.D., Louisiana State University

Came to Field Museum: 1995

Position: Assistant Curator and Head, Birds, Department of Zoology

What do you study at the Museum?

I study the systematics and evolution of birds. What I do is use DNA sequences, morphology, and behavior to reconstruct how populations and species are related to one another.

Basically, these are a trees of life similar to trees people make of their ancestors, but instead of a family tree, the trees I make relate populations, species, and higher levels of taxonomic categories (genera, families, etc.)

These frameworks tell you interesting things about the Earth's history, how the geographic and ecological places where birds live evolved. You also can study the evolution of behaviors, vocalizations, and other aspects of bird natural history.

What kinds of birds do you study?

Lately I have been studying a small family of Neotropical birds called Manakins. They are well known in the bird world because of their elaborate dances and displays. Males

have bright and ornamented plumage, but females are duller in coloration (usually shades of green). These traits are commonly found in polygynous mating systems. In such mating systems, males have little or nothing to do with making nests or rearing their own offspring, which means that these responsibilities fall to female Manakins.

Despite describing displays in detail, there has been little research into the evolution of displays—the historical context. That’s what I’ve been doing for the last few years, making a tree of life for Manakins.

Do you see any ways that your work fits in with conservation?

I think conservation biology encompasses many different kinds of science. The protection of habitat is clearly a critical thing to do because habitats are under so much pressure, especially from human activities. However, I’m interested in where conservation biology is going as a science, what it does beyond habitat preservation.

I study genetic diversity. Preservation of genetic diversity is one of the goals of conservation biology, so my research has some relevance to conservation efforts. I’m especially interested in taking more community-level approaches to assessing genetic diversity. For example, do the parasites that live in and on birds have similar population genetic structures to the birds? What about the plants birds live in and whose flowers and fruits birds eat and disperse? How does genetic diversity in birds compare to other animals that live in the same areas, like mammals or butterflies, for example?

What do you love about what you do?

I love that I have the freedom to study many aspects of bird biology and evolution. Whatever captures my interests in a given period of time, I’m free to explore. That’s one of the great advantages of this kind of career. I don’t like being told what to do.

How did you get interested in this field?

By complete chance! I had taken a class at the University of Victoria on vertebrate natural history that included bird watching field trips, and I loved it. However, I was on my way to medical school when I got a summer job working in the bird collections of the Royal British Columbia Museum in Victoria. This job changed my life. We worked closely with all the bird specimens, putting them in order, getting information for computerization. I became intrigued by looking at birds close-up, which is something I had never done before. I could see there were lots of interesting things you could learn by looking at specimens.

While I was working at the museum, I was taking a biochemistry course at the University. One day the professor lectured about molecular evolution, and all my interests came together. I realized that I could combine studying DNA and looking at birds in the field and in collections and maybe make a living at the same time.

Have gender differences affected the path of your career?

Almost everywhere I go I'm the only or one of only a few women. For a while I was the only woman Ph.D. student in the Zoology Department at LSU. I still am the only woman to get a Ph.D. from their world-renowned Neotropical bird program. Life can be a little lonely in this kind of environment. Now, however, I have a few close woman friends who are both ornithologists and systematists. This makes life much more peaceful and stimulating for me.

My husband and I are in the same field of biology. In fact, we met in graduate school. Dual-career couples face some interesting challenges. We competed against each other for the job we currently hold at the Field Museum. However, we are grateful that the Field Museum was willing to try something new in splitting curatorial positions for the two of us. Having positions with equal stature has helped us in our careers and in our personal lives. I am lucky to have a husband that understands and supports my career. We are good partners and collaborators—making each other's research programs better. I believe that the sum of the two of us together exceeds the individual accomplishments we could make separately.

My husband and I also had a baby in late 1996—right when I was supposed to be focusing on getting tenure. This situation seems pretty common for women. I think family issues and concerns are major factors influencing the career choices of women scientists, and I don't think this is fully recognized or accepted by academic power structures. I think a lot of women drop out because they can't reconcile how to have successful personal lives and scientific careers. They explore alternative career pathways to academic science or they drop out all together.

I struggle everyday with my ideals of the perfect mother and wife and how that fits with my career. There are many sacrifices that have to be made to have a family and a career. However, I would not trade the joy that having a baby has brought to my life for anything.

Do you think that situation is going to change?

I hope that more women get into higher levels of the academic hierarchy and more men and women speak out about the importance of their families. Maybe then there will be a strong movement to change, or at least evaluate, the strict regimen set up for academic success—the traditional tenure system. There is not only one very narrow way to academic success—the pathway set up mostly by men of a different era. I hope there is a recognition that there are lots of different measures of success and many different pathways to travel. Sometimes you have to do something different.

How do gender issues affect doing science in general?

I believe there are gender differences in how science gets done. These are gross stereotypes, but I think on average women are more concerned with conciliation than competition. This influences the kinds of questions you ask, how you answer them, and even what you think a successful result is.

I read an interesting book lately on women in science called “Creative Couples in the Sciences.” Historically, women could succeed only through the careers of their husbands. It was rare for a woman to achieve prominence in her scientific career on her own. Things are definitely different now—we’ve made tremendous strides in the last century. However, we have a way to go to completely break the glass ceiling that prevents more women from having fulfilling careers.

Role models

Did you have a role model when you were growing up?

I would have to say that my Mom was a role model. She is very vocal about what she wants, and she went about getting it. Also, my Nona (Italian for grandmother) was a personal role model—not necessarily for what you want to do with your life but certainly how you live it.

My parents raised me to think that if I was interested in something and worked hard enough for it, I could succeed. I never felt that there were limitations on me because I was a woman. My parents treated my brother and I the same. I grew up in a community where women didn’t often expand their horizons. I was the first person in my immediate family to get a college degree, and I certainly did not grow up knowing about higher degrees. Unfortunately, there were few teachers in high school or university to point me to the diversity of careers that exist in science. I never thought, “Well, I can’t do that,” I just never knew the possibilities.

Do you see yourself as a role model?

I tend not to think too much about that. There’s nothing special about me. If I can do this, then lots of other people can as well. They just have to be exposed to the possibilities. It was a chance event that sent me to this career, which is not really the best way to be educating young people.

I am, however, encouraged by the attention being paid to girls and science and by the research opportunities provided to young people.

Advice

What advice would you give to young people who are considering a career in science or exploration?

I would tell them to try to visit as many places as possible to see what scientists do, to figure out if this is indeed what they are interested in. Nothing is better inspiration than talking to people and hands-on experience.

I also tell people to envision your life in the future—career and personal. Plan out the small steps that will build on each other to make that vision a reality. It's not easy, but I think that integrating career and personal goals will make people more peaceful and productive in the long run.

Wendy Jackson

Born: Evanston, Illinois

Education: B.S., University of Illinois at Urbana/Champaign; Ph.D., University of Washington

Came to Field Museum: 1994

Position: Director of the Conservation Training Consortium

Career

What do you do?

I'm in charge of the Conservation Training Consortium (CTC), which includes the Field Museum, the University of Illinois at Chicago, the Shedd Aquarium, and Brookfield Zoo. The consortium trains conservation professionals from developing countries, giving them a theoretical framework on which to base their conservation recommendations, decisions and programs.

I'm a behavioral ecologist and conservation biologist. I've conducted research on habitat fragmentation and the breeding ecology of birds in Kenya and I'm interested in exploring multidisciplinary approaches to the conservation of biological diversity.

How did you become interested in your field?

I started doing research on bird behavior with a professor while I was an undergraduate and got very interested in the theoretical side of ecology. Through my experiences in Kenya and other developing countries I became much more interested in issue-driven questions regarding the environment. So, not science for science's sake, but how we can use science to better manage the environment, find a more harmonious balance between people and conservation.

I'm not one of these people who since age four knew I was going to be a scientist or an ecologist. My career path has been evolving over the whole course of my life.

What do you love about what you do?

I think my work really will make a difference on a small scale. I've put a lot of effort into identifying key people in developing countries who are going to be able to influence policies, lead conservation efforts, and educate the next generation of adults. I can see the results of what I'm doing, and I can see that what I do will also have a multiplier effect--these people will go home and train their colleagues, who will train *their* colleagues, and eventually we'll be able to see a difference. It is a satisfying job.

Has being a woman made a difference in your career?

I'm not sure I would be doing this if I were a man. What I do is geared toward enabling others and seeing how I can pave the way for others, rather than just pursuing my own research. I certainly don't want to over-generalize, but I sometimes get the sense that women are more inclined to do that than men are.

I'm not sure I've experienced any overt obstacles. I think I've faced the same subtle ones that probably women everywhere have encountered.

Do you see gender differences when it comes to actually doing science?

Well, I think the "male" approach to science is to prove yourself right and to prove others wrong, to advance your own ideas and make a name for yourself as a scientist. But with issue-driven science like conservation, that is simply not going to work.

What we need to do is come up with an approach that works pretty well, even if it's not perfect, and even though it may involve not just our own ideas but other people's as well. We need to come up with the best holistic answer. Certainly there are men who will take that approach and there are women who will take the traditional prove-yourself-right approach, but I think in general women are more likely to work toward building a consensus than men are.

What other gender issues do you see within the scientific community?

The National Science Foundation, the main funding body for scientists in the U.S., has developed programs to try to encourage women to go into science. But

what they're doing is trying to lure women into fields that are typically dominated by men—engineering, chemistry, physics. And yes, one reason why there aren't more women in these fields is because they're discouraged from going into them. But a second reason is that they don't want to go into them.

Maybe the NSF ought to try another approach: Create more programs that speak to what women are interested in, the kinds of approaches women take. And they haven't done that and that I see as being a real issue. Certainly girls are discouraged from excelling in math and related subjects, but I also think we may be interested in approaching problems from a different perspective and that's been ignored.

Goals

What would you like to accomplish through your work?

What I'd like to see happen is for the perceived dichotomy, people versus the environment, to be dispelled, because I think it is false. It's not one or the other—it's both. They have to go together. Whatever I can do to try to foster this new perception is what I want to do. And whether that's in other countries or in the U.S., it's one village, this globe, and I think we all need to be working together.

A healthy environment is absolutely critical to healthy lifestyles for people, but people are often driven into misusing the environment because they have no other immediate options.

I would like to help provide alternatives to those people who are forced into those situations. I also think that a lot of the "mistreatment" of the environment is out of ignorance. Education can go a long way toward encouraging people to view the environment differently.

I see art in nature. There are many reasons to be concerned about the environment and one very important one is aesthetics. And that's true even for people who live in developing countries and make \$300 a year. Quality of life is as important to them as it is to those of us in wealthy countries.

Role Models

Who were your role models growing up?

When I was an undergraduate my advisor was a woman and she was very influential in getting me into the field that I'm in now. I was a research assistant in her lab and she encouraged me. Without that I'm not sure I would be doing what I'm doing.

My parents were always very supportive and that's important. I think for a girl to have her father be interested in her going into science is especially important. My parents never questioned why I would go into this field, and they never encouraged me to go into some other traditionally female field.

Advice

What advice would you give to a young person interested in conservation, science, or exploration?

I would say, "Go for it!" I think this may be another real gender difference, just speaking from my own experience: Questions that I've asked male mentors have sometimes met with lack of interest. Rather than being encouraged, I was discouraged from voicing a world-view that differed from the world-view of that mentor.

So I'm very careful always to let people voice their ideas. They may be crazy but that's beside the point, especially at an early age. I think we get the enthusiasm knocked out of us sometimes. Certainly I have encountered male mentors who've been excellent about encouraging people, but in general terms, I think women are slightly more encouraging of young people.

Do you see yourself as a role model?

I do and I don't. I like what I've done in terms of taking my very pure, basic science background and using it in an innovative way, but it's been a tough road for me. I've encountered some roadblocks and difficulties that I think the next generation will not encounter. But others before me have paid far greater prices for what they've done, so I think it will only get easier.

