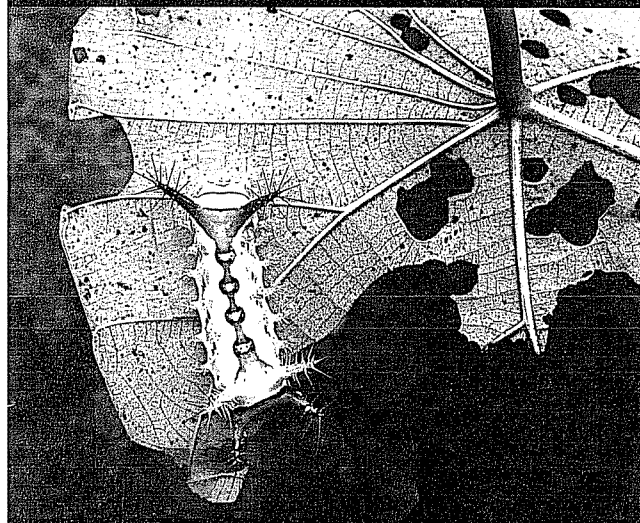




*Ethnobotany in New Guinea. Sopi, a Wamangu village elder shares the traditional name of a fig tree, *Ficus pseudojaca* known locally as "polo" in the Ulimu language provides purple dye for grass skirts.*



*A caterpillar feeding on leaves of *Macaranga*, a tropical tree of lowland rainforest in New Guinea.*



Science Village in the

By George Weiblen '92

The tropical island of New Guinea is about as far as you can get from the Minneapolis, Minnesota neighborhood that I call home. New Guinea's forests are one of the last great biological frontiers, and it was this incredible diversity that, as a plant biologist, first attracted me to this faraway place.

The island has at least 20 times more species of plants than are found in my home state, although this number is inexact because much of New Guinea remains unexplored. And time may be running out for discovering some of these species. New Guinea's tropical forest wilderness—an area slightly larger than the state of Texas—continues to shrink under intense pressure from industrial logging and a growing local population.

I first traveled to Papua New Guinea on a Watson Fellowship after graduating from Reed in 1992, in an effort to catalogue the diversity of tropical trees. However, it's the people I've met there who have kept me returning for more than a decade. Over the years, my botanical research has developed into an ongoing exchange with local residents whose future critically depends on the fate of the forest.

Papua New Guinea doesn't have national parks protecting its biological riches. Instead, 98 percent of the country is privately owned according to tribal tradition, which means that environmental protection is the sole responsibility of the landowners. This unique situation is a challenge for biologists confronted by a rising tide of species extinction in tropical forests worldwide.

Local involvement, respect, and education are essential first steps toward protecting this vulnerable habitat. I learned these lessons as a graduate student when I traveled to Madang, Papua New Guinea in search of field sites for my Ph.D. thesis research. At that time, interested community leaders had invited a team of biologists to survey the forest biota around Ohu village, near Madang. It was on a visit to Ohu that I met Brus Isua.

Page 8: New Guinea villagers gathered around an encyclopedia for the first time. Left: Dancers perform in traditional dress at the Goroka Show in 2004.

A subsistence farmer with a sixth-grade education and five children, Brus had never met a professional biologist before. As is customary with visitors, he accompanied me as I surveyed the forest paths of Ohu for fig trees. It didn't take long to realize that Brus was a person with extraordinary curiosity and a sharp eye for natural history. We chatted in pidgin English, or "tok pisin," about fig trees. I pointed out how there are more species of figs in New Guinea than occur anywhere else on earth. I told him how very small wasps pollinate the figs, how each species of fig is pollinated by a unique species of wasp, and how they depend on each other for survival. As we counted the species, Brus described their local uses and named them in Amelé, a traditional language with just a few thousand speakers. The leaves of some species make excellent stewed greens, he told me. Another species is a source of bark cloth while others provide colorful dyes for grass skirts. Some fruits make a tasty snack when salted, yet others are sweet.

"Ficus pungens," I said.

"Epe-al," replied Brus.

To my amazement, each scientific name was matched by a different Amelé name for the plant. I had found a field assistant. Choosing to work with Brus was one of the best decisions I've ever made.



Brus Isua

Within the year we had documented more than 60 different species of figs in Madang alone, and we had collected countless insects from their fruits. Many of the fig wasps that Brus found were new to science, and we sent them to experts around the world.

Brus learned how these wasps pollinate the fig flowers while laying their eggs, and how wasp larvae feed on the seeds inside of the fruit. Then one day he noticed some wasps inside a fig that looked like no other fig wasps he had seen before. He drew a picture showing how the antennae were long and curled instead of straight. Brus had just discovered a new genus! After consulting museum specimens, it came to light that Brus had made the first record of fig-inhabiting braconid wasps outside of South America. In honor of his discovery a new genus and species, *Ficobracon brusi*, was named after him. At the same time another fig wasp, *Kradibia ohuensis*, was named after Ohu village.

The fact that Brus and scientists across the globe have made such discoveries in the forest of Ohu is a source of pride in the community. With increased awareness of the uniqueness of their environment, the people of Ohu have created a reserve, the Ohu Conservation Area, to protect their biological resources for future generations. A pidgin sign at the entrance reads "tambu tru long bagarapim dispela hap bus," which means that "it is forbidden to damage this forest."

The story of Brus illustrates how the traditional knowledge of Papua New Guineans can be developed into skills that are vital to biological research and nature conservation. Realizing this, an international group of scientists and I founded the Parataxonomist Training Center at Madang in 1997. Our mission is to train local people in biodiversity research, facilitate their collaboration with scientists, and foster their involvement in conservation education efforts targeted at broader audiences.

The term "parataxonomist," which is analogous to "paramedic," was coined by ecologist Dan Janzen, who works in the forests of Costa Rica. From the Greek, "para" means "in an accessory capacity." The parataxonomists truly stand at the side of the taxonomists who are responsible for describing new species and cataloguing the diversity of life on earth. The Parataxonomist Training Center follows the footsteps of the National Institute of Biodiversity in Costa Rica (INBio), and trainees like Brus now play a prominent role in New Guinea biodiversity research.

Talented and dedicated locals with little formal education can become successful parataxonomists. They receive general training in scientific methods, biology, ecology, and conservation, as well as practical training in processing biological specimens and computing. Their expertise is essential for conducting biodiversity surveys. They collect, preserve, sort, and identify biological specimens, in addition to



*It's what's for dinner: stewed greens from *Ficus dammaropsis*.*



A large mole cricket in the lowland rainforest of New Guinea.



George Ficus, age six.

performing experiments and making observations. The result of their work is deposited for further study in museum collections in Papua New Guinea and around the world, including the Smithsonian Institution in Washington, D.C. They also take digital photos and deposit their observations in computer databases that are accessible on the web, creating a first-of-its-kind resource for New Guinea.

Parataxonomists can greatly facilitate biological research, which is an important part of managing the wealth of biodiversity in countries like Papua New Guinea. Our experience has demonstrated that parataxonomist training is also an effective means for rapid biological inventory. By transferring knowledge from international researchers to local communities, parataxonomists are placed at the cutting edge of this effort.

Our current program includes 12 parataxonomists. They range from 18 to 28 years of age, with education ranging from grades 6 to 12. Members of the team take part in a variety of research and conservation projects. Our staff has assisted biological surveys by Conservation International, World Wildlife Fund, Princeton, Harvard, and the Smithsonian, to name a few.

In addition to providing a first-rate service to the scientific community, parataxonomists reach out to local communities at the grassroots level through environmental education. Naturally, they are more effective at addressing local audiences than experts from overseas. Parataxonomists are able to interpret the science of biodiversity for the people of New Guinea, and this can have far-reaching positive impacts. So far, our parataxonomists have created educational leaflets, organized presentations in the primary schools, and published articles in national newspapers.

Overall, parataxonomists are an important link between landowners and professional biologists, groups that sometimes have difficulty understanding each other.

Biologists can learn a lot from landowners as well. But the tremendous knowledge accumulated by countless generations of experience is disappearing rapidly as the country develops. The children of Ohu learn English in school and the local names of plants along the forest paths are unknown to the younger generation. Because time is running out, Brus and I have a special obligation to record his traditional knowledge. It is important work, not only for preserving the cultural heritage of Ohu, but also because of the potential for new medicines, new materials, and new technologies. The opportunity for discovery is incredible, but unless conservation goes along with development, we may lose it. That is a compelling reason for doing fieldwork on the last frontier.

With support from the Papua New Guinea Bush Foundation, Brus opened a small laboratory in Ohu village in 1999. The "bus lebotory" has been a boon for our research, but it's difficult to find support for the effort from government funding agencies. Thanks to recent donations, however, his lab is now equipped with solar power, a computer, and even a mobile phone for emergencies.

The naming of new species after Brus led him to name a son after me, and the project that brought us together. George Ficus was born in 1997. As George Ficus approaches his seventh birthday, the local forest is still healthy, thanks in part to the steps that Ohu has taken toward a sustainable future. I hope that George will have the opportunity to share with his children the very things that his father has shared with the rest of the world.

More information about parataxonomists in New Guinea can be found on the web at <http://geo.cbs.umn.edu>.

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