

# CAREERS

**BREXIT** There is reason for consternation over UK departure from Europe **p.249**

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JASON HOUSTON



Christopher Dick is well versed in the dangers posed by snakes on field trips.

## HEALTH AND SAFETY

# Danger zone

*Fieldwork often involves significant threats to safety.*

BY EMILY SOHN

Evolutionary biologist Christopher Dick was collecting seeds in the Brazilian Amazon when he was bitten by a fer-de-lance (*Bothrops asper*), one of the rainforest's most notorious venomous snakes. He and a field assistant were 1.5 kilometres from camp and 90 kilometres north of the city of Manaus. They had no mobile phone or Global Positioning System (GPS) device (it was the 1990s) and the supply vehicle wasn't due for two days.

Using a venom-extraction kit, Dick picked out some coagulated blood from the bite marks on his ankle. Then he walked back to camp. While he waited for an emergency pick-up, one

local tied a piece of bark to his ankle, another offered to spit in his mouth and a third suggested that he drink the local alcohol. He declined the offers.

Arriving hours later at a small hospital, nurses injected him with anti-venom. Dick spent the night on an operating table under fluorescent light. Then he was moved to a bed in a roomful of people who had various tropical diseases. The bathroom had no toilet paper, no one had cleaned his wound and a nurse told him he would need to stay for two weeks to be monitored for secondary infections. He found a pay phone and hailed a cab so that he could join his colleagues in Manaus, where he slowly regained his health. When Dick returned

home to Massachusetts several months later, medical tests revealed that he had three diseases, including German measles.

Dick recovered completely, but gained an appreciation of the risks that come with fieldwork in his discipline, and for the need to prepare for them in advance. "I want to go over all of the potential pitfalls and dangers and have plans available for contacting me or someone else who can help immediately," he says of the graduate students at the University of Michigan in Ann Arbor, whom he plans to bring to Brazil next summer.

Opportunities to do research in the field attract many scientists who are eager to experience adventure while making discoveries. ►

► But travelling to foreign lands and working in remote places carry risks of injury and illness that are often difficult to predict and are challenging to navigate.

There seems to be no central database to log illnesses, injuries and deaths among scientists in the field. And many mishaps are likely to go unrecorded because researchers either don't see the need to report what happened, fear putting their funding at risk or want to avoid the hassle of the reporting process. You cannot prepare for everything, and it's important to accept that some accidents, such as those triggered by freak occurrences, are unavoidable, just as in all workplaces. But researchers who travel into the field recommend preparing detailed analyses of, and action strategies for, everything that could possibly go wrong — from riots to malaria. If calamity strikes, a sound plan could make the difference between tragedy and escape (see 'Be prepared').

#### ADVANCE PLANNING

Cultural anthropologist Christopher Kovats-Bernat, an explorer-in-residence with the

National Geographic Society who lives in Allentown, Pennsylvania, says that advance knowledge of potential dangers in the field would have helped him to avoid and deal with them better when he started his career. He began studying violence among children in Haiti during a particularly bloody period in 1994. Kovats-Bernat's research on street children and armed gangs has taken him into a Haitian ghetto called Cité Soleil, once described by the United Nations as the most dangerous place on Earth. He developed a traumatic brain injury and partial hearing loss when his shoulder was used as a gunrest, and got shrapnel lodged in his eye during a gunfight between child soldiers.

Kovats-Bernat has had a life-threatening anaphylactic reaction to a spider bite, three cases of malaria, a persistent case of giardia infection and three bouts of dengue, including one that coincided with a chikungunya virus infection and landed him in critical care for a week. And his work and its fallout have left him with post-traumatic stress disorder, a risk to researchers who work in dangerous places that he thinks continues to be unaddressed

and underacknowledged by educators and by his professional anthropology association. "I was never told anything about dangers during undergraduate or graduate training," he says.

These days, Kovats-Bernat teaches his students about all the risks and dangers associated with fieldwork and how to prepare for and deal with them. He trained as an emergency medical technician, and in advanced first-aid and triage trauma care, to deal with mishaps in the field. He carries a trauma kit that includes intravenous drips, injectable lidocaine, sutures, a military field surgical kit, bandages and rehydration salts, along with 32 prescription and over-the-counter medicines. His pack also contains enough cash, clothing, food, water, self-defence gear and other supplies to last for four days. And once he knew that he would be spending a lot of time in Haiti, he learned the Haitian Creole (Kreyòl) language so that he could understand what locals were saying to — and about — him.

A sound plan for averting disaster on field trips should include staying in top physical condition, says Laurent Godin, a structural geologist at Queen's University in Kingston, Canada. And like Kovats-Bernat, Godin recommends taking emergency medications, clothing and other supplies, as well as working with experienced local guides and having direct contact with drivers and emergency services. The strategy paid off during a research trip to India in 2008 to date rock formations. One morning, Godin climbed up a steep, snow-covered slope to collect some rocks. On descent he hit a patch of ice, slid and twisted his ankle by 100 degrees.

His fitness and advance planning helped him to navigate the subsequent gruelling challenges. After taking some ibuprofen from his well-outfitted pack, Godin worked out his GPS coordinate, tightened his boot to support his ankle and donned mittens. Then he crawled for a couple of hours until he reached two colleagues, who helped to transport him to camp (and returned for the rocks). After a painful night, Godin struggled onto the back of a donkey for a six-hour ride to the nearest road. He was then driven in a jeep to Leh, where he bought a cane and booked a flight to Delhi and then home. At the hospital in Canada, he learnt he had torn three of his ligaments but had not broken any bones; he raced in a triathlon a couple of months later. "If all hell breaks loose, you know you've got a body you can count on," he says.

Fitness might be less relevant, however, in the face of disasters unrelated to extreme circumstances: researchers also need to be wary of seemingly mundane risks such as road conditions. Ecologist Douglas Yu, of the University of East Anglia in Norwich, UK, was driving with his wife and their dog along a slippery mountain road in China in 2012 to view flying squirrels. The car skidded, tumbled down a ravine and rolled over several times. Although the car landed upright, his wife was unconscious

## BE PREPARED

### What to do before you go and while you're there

Field researchers need a plan to avoid disaster and for how to deal with it when it happens. "You don't want to push the abort button at the end when so much is at stake, you have a graduate student starting a project and it's costing you US\$20,000 to be there," says Laurent Godin, a structural geologist at Queen's University in Kingston, Canada. "Have a plan in place."

Here are some tips.

#### Before you go

- Take workshops to learn leadership strategies, and practise safety plans using role-play scenarios. What if you are rattled by an encounter with an elephant en route to a field site and want to turn back, but your team leader wants to continue? Or it starts pouring with rain four hours before a boat is scheduled to pick up your team, and your field assistant forgot his rain gear?
- Most institutions require researchers to complete a field-research hazard assessment that includes estimating risks and how you would minimize or deal with them. Even if your institution doesn't, do one. Godin's hazard list includes avalanches, earthquakes, political instability, street riots, land mines, dysentery, malaria, altitude sickness and rock falls.
- Get the relevant vaccinations, find out where the international clinics are in overseas destinations and build in a financial cushion for dealing with

emergencies. There may be opportunities for emergency-evacuation funding within your field.

#### In the field

- Know where your team members are and never work alone. Develop a communication plan, with a schedule for checking in with a designated contact who will call for help if the check-in doesn't happen.
- Always have a mobile phone with you; keep it charged.
- Be trained in first aid, have a complete first-aid kit in camp and take a small one in your day pack.
- Keep your passport with you and have good insurance.
- Carry a loud whistle to alert teammates that you need help.
- Be ready to make quick decisions in the face of danger and to enlist the help of locals. Ecologist Douglas Yu of the University of East Anglia in Norwich, UK, was surveying trees in the Amazon in 1999 when his indigenous companions heard bird-calls that sounded like the tinamou — but the season was wrong. Instead, the calls signalled the presence of an aggressive tribe. Yu and his team left immediately. More recently, Yu cancelled a trip to Ethiopia because of riots. He makes such rules for all trips. "You have to be able and willing to say no," he says. **E.S.**



with concussion and had broken some bones. But their safety strategy prevented tragedy — their car had a sturdy frame, seat belts and air bags, and had been carefully packed to prevent injury from loose equipment.

### KNOW WHEN TO SAY NO

To stay safe, researchers sometimes need to breach local social protocols or act in ways that might seem rude. Medical anthropologist Patricia Omidian, co-director of Focusing Initiatives International, a non-profit organization in Monsey, New York, once broke a tooth while working in Kabul. At a recommended dentist's clinic, she saw no sign of soap, alcohol cleansers, gloves or disinfectants. Drills went from one mouth to another without getting cleaned. She left immediately. "Don't be nice," she says. "If it's not hygienic enough, you're out of there."

Similarly, Yu observes the behaviour of drivers when he's on research trips in the Peruvian Amazon and China, and if he suspects the drivers have been drinking, he politely sniffs their breath for alcohol. He tells them to slow down if they're driving fast. "You have to be a little bit bossy," he says.

**"There are no rocks worth losing your life over."**

"That will save your life."

Indeed, one unfortunate experience can be an effective teacher. "There are no rocks worth losing your life over," Godin says.

But despite the hazards, researchers point to a range of rewards of fieldwork — from publication in influential journals to personal growth. Omidian, for example, has discovered deep wells of human compassion that have helped to inspire her. A woman she met in Liberia during the height of the most recent Ebola outbreak was caring for nearly two dozen people without health-care facilities or equipment — just plastic bags, chlorine and soap. "Even in the worst situations, people can be kind and generous," Omidian says.

Omidian remained in Liberia during the worst of the Ebola outbreak in 2014, to gather data about people's health concerns, because she believed in the importance of her work. "Everyone was scared, people were dying — it was really frightening," she says. But after her team had been talking and listening to local residents, the emotional tenor shifted. "People started saying, 'We're a community. We have to deal with this.' To be part of that was really special."

Such inspirations and experiences keep researchers coming back to the field again and again. Six months after his snake bite in Brazil, Dick returned to the rainforest, where another fer-de-lance lunged for his waist. This time, it missed. ■

**Emily Sohn** is a freelance journalist in Minneapolis, Minnesota.

## TURNING POINT

# Uncertain future

*After the referendum in June in which the United Kingdom elected to leave the European Union, Victoria Forster, a cancer researcher at Newcastle University and a UK native, wrote a column in The Guardian supporting her foreign colleagues and predicted how Britain's exit (Brexit) might affect cancer care. She explains why she probably won't be returning to the United Kingdom after her forthcoming postdoc in Canada.*

### Describe your reaction to the Brexit result.

Like the vast majority of academics, I didn't want Brexit. The potential impacts were so clearly negative. The night after the vote, I attended a birthday party for a Polish friend with five people from the EU. It was so demoralizing. These are talented, hard-working, qualified people working in medical research. The vote had made them feel very unwelcome.

### What was the response to your piece in *The Guardian*?

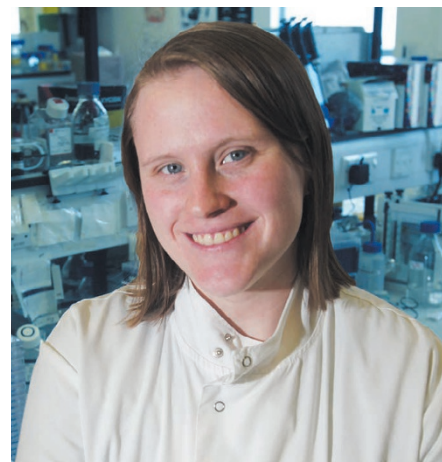
From scientists and other academics it was extremely positive. Many people thanked me for giving these perspectives a voice. Some relatives of people with cancer were horrified that research relevant to their family's care may be impacted. It was something they hadn't thought about. Of course, a few people made comments about scaremongering, and said that research wouldn't be affected.

### Has the vote affected your European friends in the United Kingdom?

I haven't seen anything myself, but I have close colleagues and friends from mainland Europe who have been insulted on the street. Some won't speak to their children in their native language in public any more.

### Has Brexit changed your career plans?

I had already accepted a postdoc in Toronto before the Brexit vote, but had assumed I would return to the United Kingdom afterwards. I have a house and family here. But even in the lead-up to the referendum, seeing the intolerance directed at my colleagues I went off the idea of coming back. I think it's likely that there will be funding problems in a few years, when I would have come back. I will investigate staying in Canada, or perhaps going elsewhere outside the United Kingdom. I know at least four or five other Brits who have said they will leave the country as soon as their contracts are up. But it's



not something everyone can do, especially if they have children.

### How would you describe the UK funding outlook?

It's always a scramble for funding and everyone spends large amounts of their time writing grants. This is a further hit. The big UK cancer charities rely to some degree on investment portfolios and their budgets must be modelled quite far in advance. I would not be surprised if there is less money available in future.

### Are any of your grants in jeopardy?

I was planning to apply for EU funding for a project that builds on early results on a rare side effect of a drug for childhood cancer. I collaborate with researchers in Scotland, the Netherlands, Sweden and Germany on the project. That grant application is now up in the air. For that project, there are simply not enough people in the United Kingdom alone to create good data and records. We need to collaborate with Europe.

### How would you describe the atmosphere now?

The shock is over, but things are still uncertain. My EU colleagues are resigned to the knowledge that they have no confirmation of status, and we realize we're not going to get new information until the politicians are ready. Much of what people thought a Brexit vote was for is unravelling. There's likely to be no additional money for health services or for immigration reform, as was claimed before the vote. It was all so predictable — but I don't feel any satisfaction. ■

**INTERVIEW BY VIRGINIA GEWIN**

This interview has been edited for length and clarity.