

Back from the dead

Under successive military governments, the discipline of forensic medicine nearly perished in Brazil. But it is starting to bounce back, inspired by a remarkable institute near São Paulo. David Adam pays the centre a visit.

It's harvest time in Brazil, and the sugarcane fields are about to yield a bumper crop. But alongside the sugar will come a grisly haul. Fields of fast-growing sugarcane are a favourite dumping ground for killers with a corpse to hide. And when the harvest is gathered in, so too are the remains of missing people.

The task of investigating these discoveries falls to experts in forensic medicine. But in Brazil, these are in short supply — a legacy of the police state that prevailed from 1964 to 1985. Under military rule, forensic labs were directly controlled by police chiefs, which ensured that the activities of government torturers and death squads were covered up. Independent work in the field was all but impossible. And although the dark days of the 'disappeared' are now past, Brazilian forensic medicine remains largely moribund.

Except, that is, in Ribeirão Preto in the state of São Paulo, where a new centre for forensic medicine — termed legal medicine in Brazil — has been built on the fringes of the University of São Paulo's campus. Within its brightly painted walls, more than 300 kilometres north of São Paulo city, forensic pathologists work in relative independence, and in partnership with university researchers.

The centre owes its existence to the tenacity of its director, a quietly spoken forensic pathologist called Carmen Cinira Santos Martin. "It took 19 years of fighting," she says. Martin has been at the Ribeirão Preto medical school since 1980, and witnessed the decline of its legal-medicine department. Staff drifted away, and the building was eventually turned into an administration block.

Martin cut a lonely figure in those days: consigned to two shabby rooms in the corner of the pathology department with no laboratory facilities, her discipline became an option that tutors threatened their students with to ensure that they did their homework. "My teachers told me there was no future in it," says Sergio Britto Garcia, a pathologist who now works in the new centre for one day a week. "When you look around this modern building, you think that the university officials must have had a plan, but it wasn't like that. Carmen did it all. She's a hero."

Martin is modest about her achievement. "If I was alone, that meant I was the only one



who could do it," she says. Her opportunity came with a 1998 decision by the state of São Paulo to wrest its legal-medicine institutes from police control, making them accountable to state officials. "When I heard about the change in the law, I knew it was now or never," Martin says. Aided by another legislative change that encouraged partnerships between state institutions — in this case her university and the state officials newly placed in charge of legal medicine — Martin convinced the university authorities to provide US\$600,000 to construct the new centre.

It opened late in 1999, offering a new home for the 15 or so forensic pathologists of the former police institute, which was little more than a ramshackle hut in the city's cemetery. There,

On the case: Carmen Cinira Santos Martin (above) and Marco Guimarães are wresting control of forensic medicine from the police chiefs in Brazil.





Grim harvest: fields of sugar cane are favoured by killers as a dumping ground for their victims.

break-ins were common, and gruesome pictures of murder victims made regular appearances in the region's tabloid newspapers. Today, post-mortems take place in the secure environs of Martin's new centre.

The arrangement benefits both its handful of academic scientists and the state forensic pathologists. "We now have a new model here in which we combine the research, modern technology and open mind of the university with the rich materials provided by the police," Martin says. "This is unique in Brazil."

For her part, Martin is investigating differences in the physical appearance of bones broken before and after death. That quest began when a skeleton was brought to the centre with a noose around its broken neck, but pathologists couldn't decide if the rope had been placed there before or after the injury was sustained. Was it suicide, or murder? Martin's work on the subject will appear later this year in the *Journal of Forensic Sciences*.

The eyes have it

Upstairs from the post-mortem rooms, pharmacologist Bruno Spinosa De Martinis is developing new analyses to detect the presence of illegal drugs and alcohol in a dead body. With Martin, he will shortly publish his first paper: a test for alcohol using samples of vitreous humour from the eyes. The technique is needed in Brazil because the hot, humid climate quickly rots corpses and alters their blood chemistry, De Martinis explains, proudly pulling a pre-print from a drawer stuffed with evidence bags containing LSD and ecstasy. Originally a chemist studying atmospheric pollution, De Martinis decided to retrain to work at the centre after meeting Martin at a Christmas party. "I wasn't sure about working with dead people, but Carmen talked me into it," he says. "She's very persuasive."

Another researcher who succumbed to Martin's powers of persuasion is Marco Guimarães, a pathologist who is now leading efforts to develop a laboratory for human

identification. Guimarães spent most of last year in Britain learning forensic DNA techniques at the University of Sheffield, and is now applying this expertise to help solve one of Brazil's most enduring forensic mysteries. In collaboration with scientists in São Paulo city, Guimarães is working to identify skeletons recovered from a clandestine cemetery, some of which are believed to be those of dissidents murdered by government death squads.

The cemetery was discovered in 1990 on the outskirts of São Paulo, and contained the remains of up to 1,200 people. Most would have been poor residents or vagrants, but at least 15 of the skeletons are thought to belong to the ranks of the disappeared. Martin and Guimarães hope that the Ribeirão Preto centre will help to lay their ghosts to rest.

The skeletons were originally sent for identification to the legal-medicine department at the nearby University of Campinas. There, a team under the supervision of Fortunato Badan Palhares, one of Brazil's foremost forensic scientists, used facial-reconstruction techniques to match the remains with photos of the dissidents while they were alive. Progress was slow, and after articles in the press alleged that Palhares was linked to police and state corruption, the skeletons were returned to São Paulo in 1997.

They are now in the care of forensic pathologist Daniel Muñoz, who works jointly in the city's legal-medicine institute and the University of São Paulo. His pride stung when the skeletons were sent to the rival Campinas centre, Muñoz is determined not to let them go. "We can do it here in São Paulo," he insists, pointing to his team's success in identifying the passengers of a plane that crashed in São Paulo in 1996. But Muñoz has enlisted the help of Guimarães, who has already made a preliminary match between DNA from a tooth from one of the skeletons and a sample taken from a close relative of a political activist last seen alive in 1972.

Such work would be almost impossible in police institutes, which are forced by their meagre facilities to contract out most DNA identification work. This is an expensive

A crowd holds up pictures of television journalist Tim Lopes, who was killed last year.



business, so cases are often only investigated if a third party foots the bill. Last year, for example, Franklin David Rumjanek, a biochemist at the Federal University of Rio de Janeiro, used DNA techniques to identify charred bone fragments suspected to belong to television journalist Tim Lopes, who disappeared in June 2002 while investigating drug trafficking and child prostitution in one of the city's slums. Lopes' employer, the media company TV Globo, paid for the analysis. If it hadn't, the five suspects now awaiting trial for his murder would probably still be at large.

Remains of the day

In São Paulo, Muñoz finds his ambitions similarly frustrated. Several hundred skeletons a year arrive at his state legal-medicine institute for identification, but most end up being buried without ever being analysed. One recently arrived example is lying on the table in his lab. Found at the side of the road, the body was burned, and its charred clothes and a melted pocket radio are piled next to it. One thighbone has been cut into, to help judge the age of the victim. "We can work out the sex, height and age in most cases, but not much more," Muñoz says.

The skeleton will soon be moved to a room down the corridor. "Prepare yourself, we don't yet have all the furniture we need," says Muñoz, unlocking its door. From floor to ceiling around the walls, human bones are piled in plastic boxes, and bags containing more skeletons cover the floor.

Back in Ribeirão Preto, Martin's new centre, set in the rolling grounds of a former coffee farm, seems a world away from the urban sprawl of São Paulo and Muñoz's chamber of horrors. Martin says that this distance from the state's capital, where some politicians are still suspicious of the idea of setting forensic experts free from police control, is one reason her centre has managed to win a degree of independence for its scientists. Still, delaying tactics in the state parliament mean that the official paperwork endorsing the creation of Martin's new centre has not yet been signed. And money for equipment and reagents remains extremely tight.

Martin won't let these obstacles hold her back, but whether one small institute can inspire a renaissance of forensic medicine across such a huge country remains unclear. Nonetheless, Tim Cahill, Brazil specialist for the human rights charity Amnesty International, believes that Martin has established a welcome precedent. "It's a very important step to directly link the forensic medics with the university," he says.

At the very least, the centre's work should mean that the fields around Ribeirão Preto will become a much less welcoming place for killers who want to ensure that their victims are never identified. ■

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