

# A lot of leaks in Havana

Four engineering students from Bristol University have recently returned from Havana after a fact-finding trip to help to improve the Cuban capital's water supplies. Nearly 70 per cent of the water pumped into Havana is lost through leakages, often resulting in areas of the city losing water supply for days.

The students are members of the Engineers Without Borders society at Bristol, which has been working on a project called, 'Optimisation and control of the urban Cuban water supplies' since March 2005.

Following a substantial amount of research in the UK, the students went to investigate the situation in more detail

During their visit the students met Havana's local government, including the Ministry of Water Resources and the Ministry of



**The problem (above); The team (below) back row: Idel Montalvo Arango, Robert Cottrell, Hayley Sharp, Hugo Baker, Jose Ernesto Gonzalez; front row: Ian Baggs, Alejandro Perez Malagon and Karel Perez Alejo**



Science, Technology and the Environment, and the Vice-Director of the water company, Aguas de la Habana. The students tested their system in the District Metered Area (DMA) of CUJAE, which serves nearly 5,000 people.

"We looked in depth at the water network on the campus (CUJAE uses up to five times the amount of water that it should need), and are putting together a possible solution, which will be researched in greater depth next year.

"The ultimate plan is to set up an optimised solution for the CUJAE closed water network, and then possibly extend this to the whole of Havana city and ultimately to be able to use the technology to benefit water networks in other countries," Hayley said.

"Since returning to England, we've been meeting everyone who's been involved with the project at the Bristol end, including two of the southern water companies.

"We're very keen to keep up the project momentum, and need to enlist new, young enthusiastic students at the beginning of next year to ensure the success of the Havana Water Project over the next few years, and also to set up more academic links with the

with their counterparts in Havana.

One of the team, Hayley Sharp, explains: "We were mainly working with four Cuban postgraduates and (young) professors from the Polytechnic University of Havana or CUJAE. We all spent a great deal of time together as they were keen to talk with us and show us around Havana city in our spare time.

"It was fascinating talking to the Cuban team – I found them to be very politically aware and I feel that I learned a lot from them. In particular, I felt privileged that they seemed happy to talk to us freely about the benefits and disadvantages of the Cuban socialist society.

"I found the lifestyle to be very different. People were incredibly welcoming to us, and seemed to be generally more laid back than we are in the UK (particularly regarding timekeeping – we would joke about whether we were meeting at 9am 'Cuban time' or 'UK time' – but this is a result of a combination of the public transport system and the

universities."

Hayley discovered that the only problematic gender issue was football.

"I was the only female in the team. However, I never really felt that I was in a 'weak position' due to this – on the contrary the guys were always very considerate.

"Probably the worst part of the trip in this area was that we were away during the Football World Cup. I hate to strengthen the stereotype but I can't seem to find football interesting. I may be able to hold my own in water project research, but I still can't get to grips with the offside rule."

**Lesley Wray sought WES members' help with her PhD on Women Engineers in Britain. Lesley would like to thank those members who responded to her questionnaire. She explains about her thesis and her findings.**

## History of UK women engineers

I am a design engineer and occasionally get involved with careers advice work. I am continually amazed at how few women consider engineering as a suitable career. This prompted me to do some research, and in 1995 I registered for a PhD with the Open University, History Department.

My thesis was on Women Engineers in Britain. Initially the period to be covered was 1955-1975, and during my early research I sent questionnaires to 50 WES members whom I estimated would have been working during this period. I was amazed by the response. I had been warned that normally only 30% of questionnaire recipients reply, but I got a staggering 80% response. The replies included many extras, such as newspaper cuttings, work histories and the chance to use the material that Maria Watkins' students had produced on the history of WES.

The writing up of my thesis took far longer than I had anticipated. Following a break in my studies due to family commitments, I changed tutors. My new tutor advised me to extend the time scale to cover the period from 1945 to 2000.

Further research supported my own opinion, that the reason so few women choose to become engineers has more to do with attitudes about the profession than anything else. After a second

the thesis. I was awarded a PhD in April and would like to thank those members who kindly completed the questionnaires, sent out at the beginning of the project.

My thesis confirmed what most women engineers know that, contrary to popular belief, there have been professional women engineers for many years.

Their history parallels that of most career women of the twentieth century, except for the cloak of invisibility that has surrounded them. However, I was able to dispute feminist assertions regarding the degree of discrimination and harassment suffered by women engi-



neers at work. While training can be a period of difficulty for some women, once at work only a few women suffered. In fact younger women engineers now frequently outdo their male colleagues when it comes to promotion and wages.

Throughout the time-span of the thesis women engineers were shown working, achieving success at various levels, and retiring. They were recorded as marrying, having children and coping with all the stresses that every career woman suffers. An engineering career has been shown to be one that can be rewarding and fulfilling for women at all levels.

Much more work remains to be done. Maybe someone else will decide to take on the task of unearthing more of the history of Britain's women engineers. I hope so, and wish them good luck in the task.