



Scientific espionage

Live and Let Spy?

The demarcation line between exchange of scientific information and espionage is far from being clear. Consequently, in extreme cases “false positives” are being prosecuted. Jeremy Garwood reports.

Research and technical espionage is occasionally cited as a reason why certain countries have developed economically. They simply steal the ideas from other countries with more established research bases then churn out new commercial products before the original discoverers can profit from their own research and development. But what happens to the open exchange of scientific materials and information when fears of potential espionage by foreign researchers and students poison the atmosphere?

Not a very nice situation

What *can* happen is illustrated by the so-called Luu Bang case. Early one Saturday morning in April, 2006, Dr Luu Bang, a CNRS (French scientific research centre) director of research at the CNRS/University of Strasbourg's Institute of Chemistry, set out for a scientific meeting in Guangzhou, China. His wife drove him to the airport just outside Strasbourg for his flight to Paris, from where he would fly on to China. However, before Luu Bang could get to the check-in counter inside the airport terminal, the border police stopped him. They inspected his baggage and found four sealed plastic tubes containing white powder. When he admitted they were chemical samples for a scientific collaboration he was establishing with a Chinese laboratory, he was arrested on suspicion of espionage. Immediately alerted, the Director of the Institute of Chemistry initiated criminal proceedings against Luu Bang for taking the chemicals without authorisation. Although Luu Bang admits he didn't have particularly friendly relations with the Institute's Director, he was nevertheless dismayed, by midday, to find himself facing formal charg-

es for both espionage and theft. Soon, police were searching through his laboratory, computer files and home. By the day's end, the French press were running the scandalous story of a senior French scientist arrested on suspicion of spying for China. The CNRS sent him into immediate retirement with the clear intention of ending research activities that had suddenly been thrown into doubt.

Not a very nice situation to find yourself in.

Governments consider scientific and technical information to be an important part of a nation's competitive position in world markets and intervene to protect their national interests from economic espionage by other governments. For example, the US government warns of “government-sponsored or coordinated intelligence activity designed to unlawfully and covertly obtain classified data and/or sensitive policy or proprietary information from a U.S. Government agency or company, potentially having the effect of enhancing a foreign country's economic competitiveness and damaging U.S. economic security”.

Accusations everywhere

Countries that have been particularly accused of economic espionage include Japan, with its strong post-war economic development from the ashes of the Second World War, and China, the new global industrial powerhouse. However, most countries seem to be involved at some level. Hence, in addition to Japan and China, the US has accused dozens of other countries, singling out France for particular criticism every time Airbus wins a contract ahead of its own aircraft manufacturers. Meanwhile, Germany has accused Russia, Rus-

sia has accused Korea, South Korea has accused North Korea, and pretty much everyone has – surprise, surprise – accused the US of self-righteous hypocrisy for diverting its own cold war intelligence apparatus to more lucrative ends.

In Europe, warnings to public and private research institutions and companies by their respective national Security Agencies and Counter-Espionage services have taken various forms. For example, the DST (the French security service) visits laboratories to inform the scientific community of the dangers of espionage, Germany's Verfassungsschutz (BfV) (domestic Intelligence Agency) held a recent symposium in Cologne to discuss “Threats to the economy in the era of globalisation”, and the UK's MI5 suspects more than 15 foreign intelligence services are active in the UK, furthermore, in December 2007, its Director General wrote to UK companies highlighting the increased risks of Chinese espionage.

Fortunately, for Luu Bang, there was considerable written evidence that he was indeed going to China to set-up a scientific collaboration. Furthermore, he had been invited to do so by the Scientific Attaché at the French Consulate in Guangzhou. Indeed, the French Ministry of Foreign Affairs had specifically asked Luu Bang to become head of a programme to encourage French-Chinese scientific exchanges and it was they who were paying for his flight and stay in China.

Luu Bang was born in Cambodia to Chinese parents and speaks Chinese fluently. He came to France to study at the age of 18 and has worked for 35 years within the Institute of Chemistry at the CNRS Centre for Neurochemistry in Strasbourg. His research has looked at the structure, synthesis

and activity of natural compounds present in traditional Chinese medicine and he has published over 160 scientific papers.

The white powder he was carrying on his aborted trip to China was tCFA-15, a synthetic trimethyl cyclohexenonic long-chain fatty alcohol, which had already been patented by Luu Bang and the CNRS. He had published several papers indicating that it had neurotrophic properties and that it could induce neuronal differentiation of mouse embryonic stem cells. For Luu Bang collaborating with the Chinese laboratory represented an opportunity to extend his studies of tCFA-15 to human embryonic stem cells – China has fewer restrictions on stem cell research.

In an e-mail before travelling to China, Luu Bang told both the French consulate and the Chinese lab that he was bringing a sample of the compound to advance the preliminary studies needed to assess the project's potential. In fact, Luu Bang is convinced that it was this e-mail that led to his arrest at the airport before he'd even registered himself at the check-in counter. At what point his e-mail might have been intercepted is a matter of speculation. However, the fact that he has a Chinese name and was communicating with China probably didn't help matters.

A painfully wrong suspicion

Luu Bang received public support from many scientists, including his PhD supervisor, Guy Ourisson, a former president of the French Academy of Sciences, and Jean-Marie Lehn, the Nobel Prize winning Strasbourg chemist.

The Criminal Court in Strasbourg found Luu Bang innocent in October 2006, but the state prosecutor appealed and it was not until December 2007 that the Appeal Court finally confirmed his innocence. The court noted that it was ridiculous for the CNRS to pretend that Luu Bang had failed to observe official procedures for the transport of scientific samples since at the time there were no such CNRS regulations. It was not until September 2006 that the CNRS produced an 11 page 'Material Transfer Agreement' to be filled out and endorsed with multiple signatures when giving their property to another lab.

Luu Bang is still waiting for the CNRS to give him the emeritus status that would

permit him to continue his research. He maintains contacts with labs in Taiwan, Japan and Korea but said that the Chinese lost all interest once they heard what had happened to him.

He considers fears of scientific espionage to be misplaced and often based on ignorance of the realities of scientific research. In the case of his compound, tCFA-15, the structure was published and patented. Despite experiments that indicated effects on neurons and neural stem cells, any possible therapeutic applications would probably require "at least 10-15 years of intensive research in France" to develop a clinical product. Even if the Chinese were to obtain all the chemicals and research information contained in his laboratory, he couldn't see how they would be able to develop a commercial product any more quickly.



Luu Bang – a "false positive"

According to Professor Pierre Louisot, an enzymologist who, from 1982-2007, was also responsible for security at INSERM (the French medical research institution), "Scientific espionage obeys a handful of rules, based on the triptych: open documentation, closed documentation, specific commands. Open documentation is, by definition, freely available. It includes the specialised journals, general documents, organigrams, directories, newspapers, advertisements, apparently innocent questionnaires which careless researchers answer with the greatest of pleasure, etc. Well exploited by numerous conscientious and knowledgeable professionals in certain countries, this documentation is of an extraordinary wealth for those who know how to read, class and condense it. It reveals the weak points and secrets of what we call euphemistically the closed documentation, the essential target of specific commands realised by specialists of scientific espionage, who – we often forget – leave nothing to chance and are not friendly vagabonds browsing through their neighbours' scientific space in a miraculous search for a brilliant discovery."

Enthusiasm or espionage?

However, how justified are calls for a tightening of the exchange of scientific information among researchers and students? Especially when such measures implicitly target foreigners, notably Chinese nationals, calling for close supervision of their activi-

ties in laboratories and the taking of active measures to restrict their access to information. Hardly ideal conditions for a productive and stimulating international research environment. Reports of research spies and tightened security have tended to place suspicion on ethnic or foreign researchers and students in European and American laboratories. Many foreign students, highly motivated by their chance to learn and do research in Europe, have a desire to absorb as much information as possible, photocopying huge piles of articles and accumulating PDFs and other electronic files. But where is the demarcation line between enthusiastic learning and espionage?

Imprisoned

Li-Li Whuang, a 22 year old Chinese engineering student at the Compiègne Technical University in France, fell foul of her zealous desire to learn as much as possible from her six month training period with Valeo, the car equipment manufacturer. In April 2005, she was caught copying computer files that were not related to her training. At her home a hard disk was found containing files copied from Valeo, who claimed that they were secret and that Li-Li had broken a confidentiality clause in her contract with them.

Accused of industrial espionage, Li-Li was held in prison for 53 days. The French press widely covered this flagrant case of 'Chinese industrial espionage', reporting that investigators had found six computers and two large hard disks at Li-Li's home filled with 'confidential' documents, that she had hacked her way through Valeo's computer system and was in possession of coded messages from China written in Chinese.

The facts appeared more anodyne. It seems Li-Li was using a computer at Valeo reserved for trainees and that when copying files to continue her work at home she 'simply' copied the entire hard disk, containing old files from previous trainees, some of which were confidential. At home, she and her boyfriend each had a desktop computer in addition to her portable computer, a single external hard drive and two USB memory keys. Her Defense suggested that, contrary to press reports, she had not hacked into any computer systems nor broken any security codes. Moreover, the information she had copied was freely accessible to her and she was not aware that she was forbidden to look at it. Indeed, if anything, her case revealed a rather lax attitude towards trainees and supposedly confidential files

at Valeo. The company did not appreciate the adverse publicity.

Despite her legal problems, Li-Li went on to obtain her engineering diploma and is currently studying for a PhD. At her ultimate trial in December 2007, Li-Li was finally found guilty of breaking her confidentiality clause and of fraudulently copying computer files. She was sentenced to two months in prison, conveniently matching the 53 days she'd already served, and promptly released back to her research. However, she is still being pursued by Valeo for 150,000 euros in damages due to the bad image she has given their company!

The scale of suspected Chinese scientific espionage in Europe ballooned out of all proportion when, in 2005, a self-confessed Chinese research spy defected in Belgium. The agent, who had worked in European universities and companies for more than ten years, gave detailed information on 'hundreds' of Chinese spies working at various levels of European industry to the *Sûreté de l'Etat* (Belgium's security service). In addition to providing social facilities, the 700-strong Chinese Students and Scholars' Association at the University of Leuven allegedly served as a front for co-ordinating industrial espionage activities across Western Europe. According to an intelligence official, the association enabled China's Ministry of State Security to maintain contact with a wide spectrum of Chinese citizens living across the continent. Similar Chinese Students and Scholars' Associations exist at universities throughout Europe and receive funding from the Chinese government. Counter-espionage services in Germany, France, Britain and Holland were reported to have begun detailed investigations based on the Belgian defector's claims.

Chinese sand picking

"The Chinese don't pay for information. The Chinese don't ask for entire documents, employing a maddeningly slow thousand-grains-of-sand approach instead." For many years, US intelligence agencies have been explaining that China has an entirely different approach to the whole question of scientific espionage, combining oriental mysticism and the effect of mass. For example, a former FBI assistant director for intelligence contrasted Soviet and Chinese spies: "If a grain of sand were a piece of information, the Soviets would bring a submarine offshore in the dead of the night and send a dinghy with men in it dressed in dark wet-

suits who would fill a bucket of sand and go back to the submarine and steal away in the dead of the night. The Chinese, on the other hand, would send 100,000 bathers to the beach in broad daylight and during the course of the day, each bather would pick up one grain of sand and bring it home with him." Following this logic, "numerous low-level spies painstakingly collect one small piece of information at a time until the intelligence question is answered. Kind of like building a beach one grain of sand at a time." It staggers the imagination to think of thousands of bureaucrats in China sorting through these piles of sand with their metaphorical buckets and spades!



Evidently, such stories only serve to cast doubt on every single Chinese student or researcher who shows the slightest interest in, well, pretty much anything. Even if we ourselves can't see any immediate value in such information, who knows what China's Ministry of State Security will make of it!

Not spying but collecting information

Faced with such anecdotes, China has indignantly denied the spying allegations as fabrications stemming from narrow-minded fears of legitimate commercial and industrial competition. The *People's Daily*, the Chinese Communist Party's newspaper, ridiculed the accusations made against Li-Li Whuang and the claims made by the unnamed Belgian defector.

Not that they need worry unduly. Whether in government, business or academic circles, there is a general reluctance to do or say anything that might unduly upset Beijing and threaten access to its markets – not to mention its vast pool of fee-paying students. China has sent more than 600,000 students overseas in the past 25 years as part of a conscious policy to develop its science, technology and business skills. While some belong to well-off families who simply want their children to get a good education, most are funded by the government and are expected to return to help their country afterwards.

But the doubt remains: "It is very easy for Chinese companies or intelligence agencies to approach these students, who are often quite nationalistic, and get them to collect information," says Christian le Mière, Asia Editor of *Jane's Country Risk*.

Fuelling a paranoia?

Other commentators have pointed out that such practices are not so unusual and that the industrial development of Europe and the US entailed the uncontrolled flux of a great deal of technical information. Louis Turner, chief executive of the London-based Asia Pacific Technology Network, says it is a natural part of the "catch-up" process

to place people as close as possible to where the best research is being done and get them to send back information. "Just as Japan used to effectively steal a few tricks when it was learning from the West, I would be enormously surprised if China wasn't involved in some sort of technical espionage." But he maintains that China is genuinely keen on two-way collaboration – the main factors behind its rapid progress in science and technology being its sheer size, economic dynamism and willingness to learn.

Besides, why get bathers to collect grains of sand when the use of computers and the Internet makes it so much faster to sift information. In 2007, *Spiegel* magazine reported that a large number of computers in the German Chancellery as well as the research, economy and foreign ministries had been infected with Chinese spy software. The so-called "Trojan" espionage programmes were concealed in Microsoft Word documents and PowerPoint files, which infected computer installations when opened. Information was taken from German computers in this way on a daily basis by hackers based in China. Similar reports have come from the UK.

In the meantime, European Intelligence agencies and Security services have been issuing guidelines for tightening security at both public and private research centres. Sometimes, these stretch to seminars. For example, a Captain from the DST recently spoke to researchers at the CNRS Centre in Strasbourg where Luu Bang worked, warning them to be suspicious of all "Chinese-looking" researchers and students because they were probably spies, while further alarming them with the observation that the "Arabic-looking" ones were probably terrorists.

Hopefully such a paranoia will not become the norm in laboratories.