

and China inevitably involved him in the politics of communism and fascism. His ties with Russia were strengthened by his admiration for, and friendship with, I. P. Pavlov, whose well-being was the object of so much concern among the international physiological community.

Above all, Cannon had faith, as both a scientist and a citizen, in the capacity of science to transcend petty nationalism, and this faith was not broken even as he watched the abuse of science and rationality by Nazi spokesmen. He was concerned with the plight of Jewish refugees, although the faculty at Harvard was dominated by male Protestants who mostly preferred to aid their Jewish colleagues at a distance.

Harvard was, in the fullest sense, Cannon's Alma Mater. He was an undergraduate and medical student there, and spent his professional career guiding its department of physiology to a position of international pre-eminence. He was eventually able to secure recurrent funding from the Rockefeller Foundation, which enabled him to nurture his department through a period of sustained expansion. He worked with a succession of graduate students and fellows from all over the world, including Asia and South America. By the time he died, in the closing days of the Second World War, his students occupied chairs in key universities throughout the world. His had been a consistent voice, at Harvard and wherever he went, arguing for the value of medical research for human welfare, and the fundamental importance of free enquiry as a basic necessity for democratic societies.

Cannon's breadth of interests and activities endows his career with an emblematic quality. This volume is consequently as much about the maturation of American biomedical science as about the life of one individual. It is about Big Science in the making.

At the same time, Cannon's world seems incredibly remote from our own. Even at the time of his retirement, his department was minuscule by modern standards, with only a couple of other permanent members on the teaching staff. A few thousand dollars a year from the Rockefeller coffers made all the difference. Recruitment of students and fellows was often by word of mouth and can seem to us rather casual. Cannon published many research papers alone and rarely with more than one or two collaborators. Research assessment exercises were few and far between. He actually ran his own department.

Before anyone gets too nostalgic, however, we should remember that some features of modernity were also part of Cannon's scene. Many of his junior staff faced years of hand-to-mouth uncertainty. Jobs were scarce, especially during the 1930s, and Cannon spent his share of time fretting

about what would happen to his pupils. Experiments did not always go well, and priority disputes were not unknown. There was always too much to do.

On balance, though, these two substantial volumes devoted to this Harvard physiologist suggest that the first half of the twentieth century was not a bad time to be Walter Bradford Cannon. ■

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Witness after the event

A Fly for the Prosecution: How Insect Evidence Helps Solve Crimes

by M. Lee Goff

*Harvard University Press: 2000. 240 pp.
\$22.95, £14.50*

Mark Benecke

"I didn't think anyone would actually be interested in reading about my cases," wrote Lee Goff about *A Fly for the Prosecution*, his first popular-science book. Such a lack of interest, however, was unlikely, as Goff is one of a small number of scientists who work out how long a corpse has been dead by using maggots and other creepy crime-scene reconstruction assistants. Furthermore, his lectures and workshops are constantly over-crowded and his sense of humour, combined with scientific accuracy, makes him the darling of his various audiences.

Although forensic entomology has a certain fascination for the public, any forensic pathologist will tell you that it is much more entertaining to read about cases than to collect live arthropods from decaying human corpses. This is where Goff's book comes in — it is a colourful collection of forensic entomology research and cases (mostly his own in Hawaii), along with personal thoughts about how to deal with violent death and decay, and the story of his life.

An expert on mites, Goff stumbled into forensic entomology after hearing a talk about the decompositional patterns of pigs in 1981. He quit his job at a local museum and accepted a position at the College of Tropical Agriculture in Hawaii. Soon after, he and a handful of colleagues, who were either researching the activity of insects on animal cadavers or looking into the use of entomology in criminal investigations, set up an informal

group called the Council of American Forensic Entomologists (CAFE). It is highly enjoyable to follow motorcycling arthropod specialist Lee Goff — at that time, with his beard, earring and shaggy hair — to formal forensic academy meetings, into the FBI Academy, in front of highly offensive US attorneys in murder trials, and away from the preparations of a peaceful New Year's Eve dinner to collect evidence at a crime scene. Thanks to the work of CAFE members, the method has grown in popularity among US forensic pathologists, forensic scientists and the police, until now the FBI Academy includes an annual arthropod collection class in their course "Recovery of Decomposed Bodies". The CAFE-edited book *Entomology and Death: A Procedural Guide* (Joyce's Print Shop, 1990) was a collection of practical information on the subject.

One of the most valuable points made in *A Fly for the Prosecution* is how different the characteristics of insect populations are in contrasting habitats such as corpses that are wrapped or burned, those hanging above ground compared with buried ones, and those poisoned with cocaine or with other drugs. This high variability of most biological processes is not only hard to explain in front of a jury, it also dampens the enthusiasm of many students and beginners. Goff sheds light on the limits of the method, stressing that forensic entomology needs experienced practitioners. As he points out, any investigation starts to get frustrating the moment identification of an uncommon arthropod species has to meet a deadline set by a subpoena instead of by common sense.

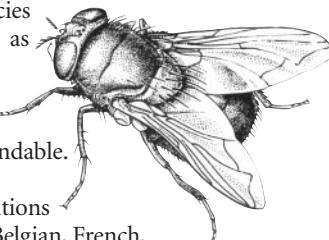
It can be difficult to persuade research agencies of the need for additional scientific studies, for example on the development of local arthropods at different temperature levels, on the identification of toxins produced by insects that have fed on corpses, and on DNA typing of insects. Therefore, it has taken years to bring the method into routine use in forensics. It is thanks to Goff and his US colleagues that

forensic entomology is now widely known as an adequate and highly effective tool in difficult questions concerning the time of death and related matters of criminal investigation. Goff's book is the culmination of this effort.

The method was discovered

and pioneered in Central Europe 150 years ago. In Europe and Asia, where the older generation tends to view any popularization of science as suspicious and unnecessary, forensic entomology was kept alive after the war by only four scientists. Such historical details are only briefly mentioned by Goff. For the same reason, the use of non-metric units and Americanized species names, such as *Phaenicia* instead of *Lucilia*, is understandable. However, the contributions of Russian, Belgian, French, Finnish, Canadian and German researchers should not be underestimated. Therefore, and to get additional perspectives into forensic entomology, I would recommend three further recent publications. One is a special issue of the journal *Forensic Science International* on the subject (of which I am the guest editor), which will also include the latest research results to be presented at an international meeting of forensic entomologists held in Brazil in August 2000 (<http://www.benecke.com/feautho.html>). There is also a well-researched popular-science book by Jessica Snyder-Sachs about to be published, and the scientific handbook *Entomological Evidence: The Utility of Arthropods in Legal Investigations* (CRC Press, 2000). Meanwhile, enjoy Goff's beautifully illustrated, scientifically sound and entertaining story. ■

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Of viruses and men

Virus: The Co-discoverer of HIV Tracks Its Rampage and Charts the Future

by Luc Montagnier
W. W. Norton: 1999. 256 pp. \$24.95, £18.95

Robin A. Weiss

The book telling the story of AIDS should be a thriller. The explosion of a deadly novel disease involving sex and drugs, its origins and the ensuing pandemic, the unfolding epic of finding its cause, the rivalry involved, the rapid development of science-based diagnosis and later treatment, how Western gays empowered patients, the hapless scene in Africa—all these facets could make gripping reading. We await an inspired writer to take up the challenge.

When Bob Gallo's *Virus Hunting* (Basic Books, 1991) was published, Mirko Grmek,

the author of *History of AIDS* (Princeton University Press, 1993) who sadly died on 6 March, remarked that "Generals write memoirs; history is best left to historians". In the battle for credit for the discovery of HIV, the general leading the French troops followed with his own memoirs, *Des Virus et des Hommes* (Odile Jacob, 1994), now updated and translated under the title *Virus*. Luc Montagnier's book comprises a brief account of his career, the discovery of HIV, and chapters dealing in lay terms with HIV and AIDS as a global problem.

While Montagnier's experiences as a young scientist in Britain are told with wry humour, most readers will zoom in on his account of the race to isolate and characterize HIV. This is by far the most interesting section of the book, whereas the second half, about the understanding, treatment and proposed prevention of HIV infection, seems rather mundane.

Unlike contemporaneous diaries, memoirs benefit from hindsight. Naturally, the author of *Virus* portrays himself in a favourable light, although he is no more self-serving than one reviewer of his book. Besides, although the French were treated shabbily over the discovery of HIV, Montagnier won this battle, as the record of research papers makes clear.

The Institut Pasteur team published their preliminary observations on a new human retrovirus linked to AIDS in *Science* in May 1983, and by April 1984 had published further papers on new isolates from AIDS patients and had found that HIV was more closely related to animal lentiviruses (by its morphology and cell-damaging effect) than to the human T-cell leukaemia viruses (HTLVs). The American team first presented their evidence for an AIDS virus in May 1984 and throughout that year maintained that it was related to the HTLVs. When the gene sequences were published in January 1985 (*Nature*, Montagnier notes, declined to consider the French paper), it became apparent how distinct HIV was. And when a West African man in Portugal developed AIDS without evidence of HIV-1 infection, Montagnier's group identified the second AIDS virus, HIV-2.

For a victorious general renowned throughout the world, Montagnier remains surprisingly bitter. He portrays himself as a prescient though misunderstood scientist who, almost alone, saw the danger of the AIDS agent contaminating the blood supply but was ignored. He complains that a plea to expand his laboratory went initially unheeded by the Institut Pasteur, believing that extra funds should have flowed automatically from his letter — perhaps he has never needed to write a proper research grant application. He feels that his theory that progression from HIV infection to AIDS requires an essential cofactor to

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