

# book reviews

## *Nobel Prizes That Changed Medicine*

Edited by Gilbert Thompson. Imperial College Press: London, 2012. 372 pp. £78.00 (hardcover). £32.00 (softcover).

As with all ‘big discoveries’, the award of a Nobel Prize in medicine or physiology – or in chemistry – probably goes unnoticed by many doctors; but sooner or later most appreciate the difference. For physicians who prefer an exalted view of human virtue through original discovery to the drudgery of healthcare bureaucracy as a guide to fulfilment, the Nobel Prize reinforces the fantasy that it remains possible for almost anyone to change the practice of medicine and the understanding of human biology by courageous experiment.

Gilbert Thompson, a former gastroenterologist, is a well-known medical investigator with an interest in human cholesterol metabolism and its disorders. He has edited a set of essays by clinical scientists and academic physicians of distinction – most of whom have either worked at, or held substantive posts at the former Royal Postgraduate Medical School, now Imperial College of Medicine at Hammersmith. His menu is appetising, for we have a conspectus of modern medicine through therapeutic discoveries (insulin, vitamin B12, penicillin, prostaglandins, statins, and even bismuth) peppered with technical advances (including imaging and cardiac catheterisation) – and nearly all with overt clinical application. The fifteen essays include original accounts of the discovery of the structure of DNA, the interpretation of the genetic code, the discovery of RNA interference, as well as the invention of the polymerase chain reaction (PCR) by the unconventional Kary Mullis. Fields of more specialised interest, and a darker side of science, include an account of the isolation and characterisation of neuropeptide hormones. The bitter rivalry between Roger Guillemin and Andrew Schally was vividly described by Nicholas Wade in his book *The Nobel Duel* – but it is interesting to learn that Schally was a sometime collaborator of Thompson’s contributor, Stephen Bloom, one of the world’s most prolific medical scientists, as well as an erstwhile Hammersmith colleague.

In a volume of only 15 chapters, each with a glance to the practice of medicine, Gilbert Thompson’s editorial choice is unavoidably invidious, but he has chosen examples which illuminate the thrill of discovery and the Sisyphean struggles of great discoverers. While the scope could easily be widened to include more prizes in chemistry, these essays are a compelling read.

We are shown that canon of history which is part of the heroic model and which so often characterises the discoverer and would-be discoverer – a linear progression of facts and a largely uninterrupted succession of events. But clearly, many fundamental discoveries go missing. Few can take exception to the

accounts provided, some with a rich vein of personal reminiscence and scientific confidences. We take comfort from these and from the presentation of scientific history in a format, defined by outcome. In the first chapter on the discovery of insulin, there was at least one major competitor of Banting and MacLeod – the Romanian scientist Nicholas Paulesco, whose huge body of work and discovery have been completely overlooked. We also should realise that teams of competitors and collaborators obtain and collate experimental results and advance the case for the final dénouement. In our own time, the award of the Nobel Prize to Robert Furchgott, Lewis Iganarro and Ferid Murad for their discoveries concerning nitric oxide as a signalling molecule in the cardiovascular system in 1998 appears cruel in its exclusion of Salvador Moncada, despite Moncada’s paper identifying endothelial-derived relaxing factor as nitric oxide; a salutary lesson in the somewhat arbitrary nature of scientific accreditation.

We must be forgiving of some of Thompson’s choices: my favourites include those discoveries which led to our understanding of the molecular biology of the living cell, the regulation of cell death and developmental programming in embryology. But where are Christian de Duve, Albert Claude and George Pallade, who laid the foundations of modern cell biology which we take for granted? Even in his mid-90s de Duve, the medically qualified discoverer of the lysosome and peroxisome as well as the actions of glucagon, remains a charismatic lecturer and author. He blundered into the discovery of the lysosome as a result of a fortuitous experimental artefact, preferring to freeze his experimental samples of liver before a romantic weekend spent with the future Madame de Duve, rather than analysing the tissue fresh after administration of glucagon to rats. The striking increase in acid phosphatase activity – but not glucose-6-phosphatase – after freeze-thawing led to an inspired guess about the particulate environment of acid hydrolases. Many great scientists create their own luck! Thompson omits the identification of HIV. Another gap is the account of the work of Edwards (and Steptoe): after all, Edwards was awarded the Nobel Prize in 2011 for his discoveries in human reproductive physiology that led to the development of assisted reproduction – a vast field of clinical activity through studies of human *in vitro* fertilisation.

Aside from the discovery, superhuman energy and endeavour (and it must be admitted, ego), there is a larger issue at stake. This collection of essays shows just how rapidly discoveries recognised by Nobel Prizes become incorporated into the practice of medicine. What was termed the ‘Nobel Prize for clinicians’ award to Barry Marshall and Robin Warren in 2005, for their discovery of the bacterium *Helicobacter pylori* as a cause of active gastritis and peptic ulcer, is a particular case in point. It was not

long before this bacterium was recognised as a class 1 carcinogen associated with most gastric cancers and the mucosa-associated lymphoid tissue lymphoma. The discoveries of Marshall and Warren radically changed clinical gastroenterology (now almost unrecognisable from Thompson's day) and revolutionised physiological understanding of gastric secretion, as well as the interactions between the inflammatory response, cell proliferation and cancer in the upper gastrointestinal tract.

Many see the Nobel Prize as an award for original discoveries that enhance understanding, but these essays show how much medicine can deliver for human good and with almost immediate application. Few purely biological discoveries can claim the Baconian advantages of utility and progress; but what characterises *Nobel Prizes That Changed Medicine* is the extraordinary percipience of those who draw from a vast eclectic range of

observations in the foreground of practice and crystallise their scientific ideas uncontaminated by dogma.

Gilbert Thompson has edited a volume that hits the mark: if he is to complete his task and transform our appreciation of the Pythonesque 'what have the Nobel Prizes ever have done for us?' question, then additional volumes should be considered. If he were immune to that combination of romanticism and intellectual snobbery that only has time for Nobel Prizes, Thompson should also convince his publisher of the innumerable pinnacles of attainment contributed to medicine by brilliant researchers not so recognised – for we would all be enriched.

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## Erratum

### Not your typical pneumonia

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Authors were erroneously omitted from the author list of this article. The full author list should read:

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