Book

Thomas Young: a medical polymath

Bemoaning the ills of over-specialisation by doctors in his essay "The Seven Sins of Medicine", published in *The Lancet* in 1949, Richard Asher recounted how an eye specialist, having seen a case of retinitis pigmentosa, wrote in the patient's notes "this might be part of the Laurence-Moon-Biedl syndrome; is there any evidence of polydactyly?" To Asher, for an ophthalmologist to feel incapable of counting his patient's fingers was the limit of specialisation. "Soon", he suggested "we will have one physician who specialises in the first heart sound and another who is only concerned with the second".

Coming at a time when Asher's worst fears have been more-or-less confirmed, Andrew Robinson's excellent new account of the life of the physician and polymath Thomas Young (1773–1829) offers much food for thought, revisiting as it does some fundamental questions about the role of professional specialisation and its potential limitations for the advancement of knowledge.

Young, a child prodigy with an early grasp of European languages, Greek and Latin classics, and Hebrew—not to mention Isaac Newton's *Principia Mathematica* and *Opticks*—was encouraged towards a career in medicine by his great-uncle, who left him a sufficient part of his estate to establish himself later as a physician in London. By the age of 21 years, several years before he completed his medical studies, Young was elected a Fellow of the Royal Society for work that led to an understanding of the mechanisms of accommodation of the eye and the basis of astigmatism. In a series of ingenious experiments he went on to show that light is a wave, supplanting Newton's corpuscular theory. Repeated over the years by physicists with more sophisticated apparatus, according to Richard Feynman, Young's famous double-slit experiment still encapsulates the heart of quantum mechanics. Young also suggested that colour vision might result from messages received by the brain from particles, or receptors, in the retina that distinguish between the different wavelengths of red, yellow, and blue light. He developed a fundamental measure of elasticity

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derived from Hooke's law of stress and strain, and his work in linguistics formed the basis for deciphering the Rosetta Stone and hieroglyphic script. And this was not all. As a young man he gave lectures at the Royal Institution spanning every aspect of science, and his contribution to a new edition of *Encyclopaedia Britannica* covered more than 20 topics, ranging from alphabet and capillary action to hydraulics, sound, and tides. Later, he examined the origins and derivations of some 400 languages.

However did Young find the time to develop his career as a physician? In fact he went through a lengthy training in medicine at Edinburgh, Göttingen, and finally Cambridge, the latter being the only way that he could ensure his later acceptance as a Fellow of the Royal College of Physicians. In 1811 he secured a position as a physician at St George's Hospital, London, where he worked for the rest of his medical career, even after he had given up his private practice. As well as his seminal work on defects of vision he wrote a 20 000-word catalogue for the second volume of his *Natural Philosophy*, based on a critical review of medical practice stretching back to Hippocrates and Galen. He published extensive works on nosology and consumptive diseases, and in his Croonian Lecture to the Royal Society, in 1808, he presented his classical observations on the dynamics of the circulation. Later he became interested in life insurance, attacking approaches of the time in a paper to the Royal Society, "A Formula for Expressing the Decrement of Human Life". This empirical formula, with its 20 constants, was so complicated that it was impracticable for the calculation of annuities, at least in the hands of normal mortals.

Young's medical writings were not universally accepted, or respected, probably because their critical nature highlighted the medical profession's ignorance and failures and hence led to his reputation as a cold man of science. The luke-warm views of some of his colleagues, reflected in his entry in *Munk's Roll* of the Royal College of Physicians, suggest that he did not focus enough on clinical practice to succeed, was not sufficiently involved with his fellow professionals, and, quite extraordinarily, did not seem to do any solid research. However, it is clear that he was a caring doctor and it is unlikely that his personality was responsible for these misperceptions on the part of his contemporaries. Rather, they seem to have stemmed from petty jealousies combined with a complete lack of understanding of his scientific achievements and a deep suspicion of anybody who did not practise medicine to the exclusion of any other activity. Sadly, it appears that Young felt that he had been rather a failure as a physician.

Although we are never likely to encounter a person with the intellectual breadth of Thomas Young again, his life and work still have implications for us today. The view

The Last Man Who Knew Everything
Andrew Robinson. Oneworld Publications, 2006. Pp 304. £17·99. ISBN 1-85168-494-8.

that it is impossible for one man to combine competent clinical practice with serious scientific research, so eloquently expressed in the mid-17th century by Thomas Sydenham, continues to haunt our teaching hospitals. Given the increasing rigidity of medical education imposed by its controlling bodies and by government, one despairs for the future of those talented few who are able to combine clinical practice with serious scientific research or equally creative activities. Yet, as evidenced by, for example, the career of the Liverpool physician, entomologist, and a past President of the Royal College of Physicians, Cyril Clarke, such rare people have much to offer. Clarke's fascination with the evolutionary genetics of butterflies, a field to which he made important contributions, led, albeit indirectly, to his work on the rhesus blood group system and, ultimately, to the prevention of haemolytic disease of the newborn baby.

Those who teach our medical students must reconsider how the multifaceted talents of people of this kind can be protected during their training years such that they are allowed to blossom later in their careers. In the past, because of reasonable flexibility on the part of those that govern medical education it was possible to nurture careers of this type; the rigidity of the current scene is making this impossible, with the danger that people with these rare gifts will be driven away from the medical profession. And, on a more prosaic note, are the guardians of our profession really content with the virtual disappearance of generalists from our teaching hospitals, particularly at a time when so many of us are living to an age at which, try as we will, we cannot package our ills into neat, specialist-tight compartments?

In his modest introduction to this fascinating story, Robinson suggests that it is impossible for one person to write a comprehensive biography of this extraordinary man. He adds that his aim is simply to introduce Young to those who are unfamiliar with him. Robinson has achieved this object brilliantly in *The Last Man Who Knew Everything*; as well as offering a wonderful testimony to the heights and vagaries of human achievement, he has, perhaps inadvertently, highlighted some disturbing questions that must be addressed if medicine is to evolve as a noble and diverse profession, at least within the broader meaning of the word.

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Before Flying Back To The Earth
Written and directed by Arunas Matelis. Studio Nominum and First Hand Films, 2006.
See http://www.

In brief

Film Living with leukaemia

There are few images more heart-rending than that of children undergoing treatment for leukaemia; their bald heads and pale skin instantly ageing them, somehow reminding us that cancer is a disease of age and degeneration, not something that should be experienced in childhood.

So how has Arunas Matelis created a documentary film so full of these images, yet not over-sentimentalised? Perhaps it is the spartan environment of the hospital. The children of Vilnius, Lithuania—on the leukaemia ward where Matelis' own child was successfully treated for leukaemia—do not have the distractions of the specialised children's wards in wealthier countries. Instead they make their own amusement: riding IV stands up and down corridors, worrying whether their hair will grow back blond or curly, and blowing up surgical gloves into "cow's udders".

The children always seem to be attached to something; chemotherapy drips or blood product transfusions, leading to endearing scenes of children trying to watch television, get dressed, and pick their nose while manoeuvring around their central line. Black and white stills are inserted into the film periodically, showing the children in extremes of emotion, usually laughing or crying, while the hospital equipment seems to lie redundant about them, unnecessary to the roller-coaster of youth. In many ways these stills seem clinical, yet they capture moments in a way that film cannot.

At times I wished there was more structure or explanation in the film, but then this only serves to highlight the confusion the parents must be feeling. Along with the stills, it also strengthens the idea that this film is a snapshot, emphasising that the children are living in the moment. "Time flies in here", says one little boy while his mother explains "we just wait and hope".

Before Flying Back To The Earth is not really a film about cancer, but about childhood and play, and children's ability to make their own little worlds in the most stressful of circumstances. But it's not all fun and games. After undergoing a bone-marrow transplantation, one of the most cheerful boys tells his mum he wants to give up and die. We realise that he has returned to the Earth and the reality that his parents and the other adults on the ward must constantly live in.

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Ten Most Wanted
November, 2006

1 **The incretin system (New Drug Class, Nov 11)**
Drucker DJ, Nauck MA. The incretin system: glucagon-like peptide-1 receptor agonists and dipeptidyl peptidase-4 inhibitors in type 2 diabetes. DOI:10.1016/S0140-6736(06)69705-5. *Lancet* 2006; **368:** 1696–1705.

2 **Rimonabant and diabetes (Articles, Nov 11)**
Scheen AJ, et al for the RIO-Diabetes Study Group. Efficacy and tolerability of rimonabant in overweight or obese patients with type 2 diabetes. DOI:10.1016/S0140-6736(06)69571-8. *Lancet* 2006; **368:** 1660–72.

3 **Lifestyle intervention and diabetes (Articles Nov 11)**
Lindström J, et al on behalf of the Finnish Diabetes Prevention Study Group. Sustained reduction in the incidence of type 2 diabetes by lifestyle intervention. DOI:10.1016/S0140-6736(06)69701-8. *Lancet* 2006; **368:** 1673–79.

4 **The MEDAL programme (Articles, Nov 18)**
Cannon CP, et al for the MEDAL Steering Committee. Cardiovascular outcomes with etoricoxib and diclofenac in patients with osteoarthritis and rheumatoid arthritis in the Multinational Etoricoxib and Diclofenac Arthritis Long-term (MEDAL) programme. DOI:10.1016/S0140-6736(06)69666-9. *Lancet* 2006; **368:** 1771–81.

5 **Young people's sexual behaviour (Articles, Nov 4)**
Marston C, King E. Factors that shape young people's sexual behaviour: a systematic review. DOI:10.1016/S0140-6736(06)69662-1. *Lancet* 2006; **368:** 1581–86.

6 **Sexual behaviour worldwide (Series, Nov 11)**
Wellings K, et al. Sexual behaviour in context: a global perspective. DOI:10.1016/S0140-6736(06)69479-8. *Lancet* 2006; **368:** 1706–28.

7 **Sexual and reproductive health (Series, Nov 4)**
Glasier A, et al. Sexual and reproductive health: a matter of life and death. DOI:10.1016/S0140-6736(06)69478-6. *Lancet* 2006; **368:** 1595–607.

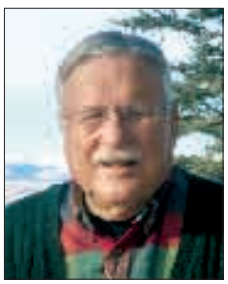
8 **Ischaemic heart disease and stroke (Articles, Nov 11)**
Danaei G, et al. Global and regional mortality from ischaemic heart disease and stroke attributable to higher-than-optimum blood glucose concentration: comparative risk assessment. DOI:10.1016/S0140-6736(06)69700-6. *Lancet* 2006; **368:** 1651–59.

9 **Rosiglitazone and diabetes (Article, Sept 23)**
DREAM Trial Investigators. Effect of rosiglitazone on the frequency of diabetes in patients with impaired glucose tolerance or impaired fasting glucose. DOI: 10.1016/S0140-6736(06)69420-8. *Lancet* 2006; **368:** 1096–105.

10 **Alzheimer's disease (Seminar, July 29)**
Blennow K, et al. Alzheimer's disease. DOI: 10.1016/S0140-6736(06)69113-7. *Lancet* 2006; **368:** 387–403.

The ten most wanted *Lancet* articles downloaded from ScienceDirect (see *Lancet* 2003; **361:** 1265. DOI:10.1016/S0140-6736(03)12982-0) in November, 2006.

Lunch with *The Lancet*
William Close



In 1960, 6 weeks before the Belgian Congo was to become independent, physician William Close went to the country on a mission with a religious and self-styled ideological movement called Moral Re-Armament (MRA). He would end up staying 16 years, long after he became disillusioned with MRA, becoming the chief doctor of the Congolese Army, personal physician to Zaire president Mobutu Sese Seko, and completely renovating a 2000-bed hospital in Kinshasha.

His relationship with Mobutu was close, but fraught. When Mobutu asked him to create a VIP medical service for government officials and senior officers in the military, Close refused, but told him he'd be happy to create a presidential medical corps, which eventually served anyone who made an appointment. Close recalls these heady years in his new book, *Beyond the Storm: Treating the Powerless and the Powerful in Mobutu's Congo/Zaire*. By 1976, he had had enough of the hustle, bustle, and corruption that had become synonymous with the Mobutu presidency, and Mobutu had become less willing to provide funds for what Close said were necessary medical expenditures. Since 1977, he's practised rural medicine in the tiny town of Big Piney, WY, USA. He, his wife Bettine, and their five dogs live on 20 acres with views of two mountain ranges. Now aged 82 years and a survivor of colon and prostate cancer, he's slowed down his practice to focus on just a few patients and on a foundation he's created to treat the terminally ill.

When I visit him in Big Piney, Close takes me to see one patient and his wife. The man, nicknamed "Toughie", has had three cardiac bypasses. Toughie tells me that when their son died of diabetes at the age of 35 years, Close came and spent 6 hours with them. Close says the importance of spending lots of time with dying patients and their families was something he needed to go to Zaire to learn.

Close is still disheartened by the health of Zaire, now led by Joseph Kabila, the son of the man who overthrew Mobutu. Despite a trip in the mid-1990s by Close and others to rebuild parts of the Kinshasha hospital renovated in the 1960s, the hospital has once again fallen into disrepair. Sleeping sickness and measles are worse than ever. "There's a real dearth of doctors now", he says. "They don't get paid, there's not adequate equipment, and no stock of supplies." Close likens the situation to Iraq: "Unless there's real security, it's very difficult to provide for people."

Close, who is the father of actor Glenn Close, may yet see his own story make it to the big screen; he's sent the book to a documentary company. For now, he says he "hopes that the book acts as a vaccine against absolute power".

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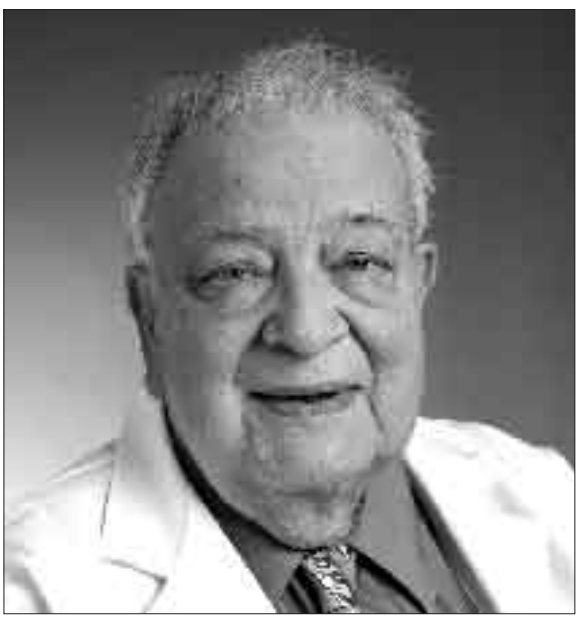

Hugo Wolfgang Moser

Paediatric neurologist and neurogeneticist who did the first clinical trials of "Lorenzo's oil" for the treatment of adrenoleukodystrophy. Born in Bern, Switzerland, on Oct 4, 1924, he died on Jan 20, 2007, after complications of surgery to remove blood clots, aged 82 years.

Hugo Moser was thrust into the international spotlight in 1992 when an Oscar-nominated Hollywood film dramatised the story of one of his patients, Lorenzo Odone. Moser had met Lorenzo's parents when, dismayed by their son's diagnosis of the inherited disorder adrenoleukodystrophy (ALD), they set out to find a cure. Moser was one of the few doctors prepared to listen. "Initially he was sceptical and the family was upset that he didn't buy into it automatically", recalls Guy McKhann, professor of neurology at Johns Hopkins University, Baltimore, MD, USA, who first met Moser 40 years ago when they worked together at Massachusetts General Hospital, Boston, MA. "But he set up studies. Everyone else thought [the Odones] were off the wall, but he initiated studies to see it if worked", he says.

Lorenzo's father, Augusto Odone, now president of the Myelin Project, an organisation he founded to find a way to reverse the demyelination that causes the symptoms of ALD, recalls his gratitude at Moser's support. "He always had an open mind", he says. The film, however, did not reflect Moser's kindness. Instead, the family was shown fighting a battle against the medical profession, a portrayal that upset Moser. "Dr Moser was not pleased with how he was treated in the movie. But he was also worried that it would create false hopes among the doctors and among patients", explains Odone. "The only regret I have is that the movie did not treat him well enough."

Moser was, above all, an advocate for children with mental retardation. "When you look back to the 1950s, there were very few scientists attracted to this issue and willing to study mental retardation as a career. Hugo Moser, however, had a complete and total commitment to this field", says Gary Goldstein, who succeeded Moser as President of the Kennedy Krieger Institute in 1988, when Moser returned to full-time research as director of neurogenetics at the centre. Throughout his long career, Moser's main research focus was on inherited disorders that affect the nervous system in children, particularly ALD. Together with his research team, first at Harvard University and then at the Kennedy Krieger Institute, he identified the biochemical abnormalities in ALD, established diagnostic tests, and set up programmes to assess therapies.

McKhann says one of Moser's most exceptional qualities was his ability to see a problem through from start to finish. "He did the whole spectrum of things. He went all the way from working out the basic mechanism and going through to therapy. There are very few people who can do that", he says. With his wife and fellow scientist, Ann, with whom he worked closely, Moser would stick at a question even if he couldn't see an answer. "He stayed on a problem, chewed on it, and worked on it. He just kept at it", says McKhann. For children with ALD, this dedication has paid off. In July, 2005, the first published paper from a 10-year trial testing Lorenzo's oil for prevention of symptoms of ALD showed positive results. And in July, 2006, the Mosers published a study outlining a technique for ALD screening that could be added to existing screening programmes for newborn babies in the USA. His widow is now leading broader testing of the technique at the Kennedy Krieger Institute.

Colleagues remember Moser's warmth, generosity, and hospitality. He opened his home to several visiting students and physicians. One of these was Christiane Theda, now assistant professor in the department of paediatrics at Johns Hopkins University. "In his so typical open and generous manner, Hugo invited me as a young German medical student to stay with his family while I was working in his and Ann's laboratory. I then had the privilege to become a member of the family", she explains. "Hugo was one of the world's best, not only as physician, academician, and researcher, but also as one of the kindest, most empathic, and warmest human beings I will ever know." Moser is survived by his wife, Ann, three daughters, and four grandsons.

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