Acta Crystallographica Section D
Biological Crystallography
ISSN 0907-4449

Guy Dodson FRS (1937–2012)

Photograph kindly provided by Brian Matthews.

One of the most beloved and influential figures in the development of protein crystallography, Guy Dodson passed away peacefully on Christmas Eve, with his wife Eleanor and other family members at his side. Guy was an inspirational scientist whose engaging personality and passion for science have enriched the lives of many people round the world. Like many others I consider it a personal privilege to have known him.

Guy was born in Palmerston North, New Zealand, a small provincial city he liked to describe, affectionately, as 'the centre of the universe'. His secondary education was at Dilworth College, a small Auckland school with a mission to 'support, educate and train' boys from disadvantaged backgrounds. Whether Guy was ever 'trained' is debatable but there he and his twin brother Maurice – with whom he remained very close all his life – acquired a love of sport, history and science, together with a healthy disregard for authority.

Guy's love of crystallography and the concept of 'seeing molecules' came as a student at the Auckland University College. On attempting to enroll in history (his first choice), he was faced with a late enrolment fee of £10 – so chose chemistry instead. His career shows how fortunate that choice was, but he remained passionate about history; his Churchillian orations are legendary! Luckily, he found in Auckland an excellent crystallography research group, and undertook the X-ray analysis of a plant alkaloid as his PhD topic. He remained very grateful for the freedom he was given by his tolerant supervisor, David Hall, who gave guidance, support and crystallographic training while turning a blind eye to the impromptu cricket, water fights, fire extinguisher episodes *etc.* that punctuated laboratory activities.

Guy's move to Oxford in 1962, when he went to work with Dorothy Hodgkin on what was originally expected to be only a short-term postdoctoral position,

transformed his life. The revolution in the development of protein crystallography was gathering pace, and he became Dorothy's right-hand person in the successful solution of the structure of insulin, achieved in 1969. He also met and married Eleanor and fully embraced the Hodgkin philosophy of allowing individual talent to mature.

I came to Oxford in 1967, barely knowing what a protein was and somewhat overawed (should I wear a tie to the laboratory?). Guy's reaction was typical, warm and welcoming – definitely no ties! My initial brief was to develop data collection strategies on the new four-circle diffractometer, but I became absorbed into the insulin team, socially and scientifically. Guy and Dorothy shaped my whole approach to science, just as Guy was to do for many others later, making me feel that it was important, exciting and fun and best of all that I could do it! I went back to New Zealand full of confidence.

Guy remained in Oxford until 1976 when Dorothy retired. These were exciting days as the biology of insulin began to be teased out. It was already apparent that the hexameric 2Zn structure did not give all the answers, but many insulin biologists and clinicians came through the laboratory, and there were many 'aha!' moments when visitors would suddenly see the structural basis for some aspect of insulin behaviour.

Guy was sometimes asked 'what will you do next?' His answer was 'I haven't finished with insulin yet – there are so many interesting variations to explore'. This determination to understand insulin's conformational flexibility and complex biology has been richly vindicated: several billion-dollar drugs in the form of both rapid-acting and long-lasting insulin derivatives, developed by Novo Nordisk in collaboration with Guy's group; and most recently a *Nature* paper on the insulin:insulin receptor structure, where Marek Brzozowski has sustained the York passion for understanding insulin, in collaboration with Colin Ward and Mike Lawrence in Australia. This latter paper, accepted just before Guy's death, brought enormous and very fitting satisfaction.

In 1976 Guy and Eleanor moved to York (where Maurice was already a lecturer in Mathematics) to set up a new laboratory in the Chemistry Department. The move surprised many, as they could have stayed in Oxford, but it was to bring the full flowering of both their talents. Their warmth of personality and large network of friends brought a steady stream of visitors, many of whom found a place in their cavernous home at 101 East Parade. You never knew who would appear for breakfast.

When I arrived with my wife Heather and our family to spend a year (1977–78) in York, the laboratory was very small, just three people. My experience, however, illustrates how it would develop. In New Zealand I had solved the structure of a cysteine protease, actinidin. Guy's structural and crystallographic instincts suggested this as a perfect vehicle for attempting to refine a protein structure from scratch by least squares. Eleanor's genius for crystallographic methods, which led to her later becoming the central figure in the CCP4 initiative, made it possible, and I was the beneficiary – it was a turning point in my career. I remember vividly the Saturday when we realised the refinement was working, sitting in York Minster listening to Handel's Messiah and thinking about the R factor dropping 10%.

Towards the end of our year, Guy was invited to Lodz, in Poland, to visit a group of young researchers wishing to establish research in protein crystallography there. He suggested I go, given my experience of doing the same in New Zealand. Ultimately this brought a series of talented Polish researchers to York, who enriched the York laboratory and expanded the Dodson 'family'. Guy's

enthusiasm and openness, his generosity of spirit, and his willingness to devote his time to assisting and advising others, similarly attracted many more researchers to the York laboratory, making it a powerhouse in structural biology. Some stayed, to establish their own research programs, others moved on and made outstanding careers elsewhere. Thinking about how the York laboratory grew, it is clear that Guy was ambitious for good science, but not necessarily to do it all himself; he was very happy to enjoy the efforts of others.

As Dorothy Hodgkin had also done, Guy established effective collaborations with industry, on protein engineering, insulin derivatives and industrially useful enzymes. In 1993, Guy was persuaded to also lead a Division at NIMR in Mill Hill, where his energies established yet another internationally leading research group, bringing structural insights to biomedical research. In taking this position, he could not resist the lure of the biological research being undertaken at NIMR, and went on to play a major role in research projects dealing with malaria, TB and the structure of prions.

Guy had a broad vision. In addition to his insulin work, he conducted insightful studies of the mechanisms of action of haemoglobin and a variety of hydrolytic enzymes: penicillin acylases, amylases and lipases. His greatest delight came as he explored the exquisite beauty of catalytic sites, perfectly oriented hydrogen bonds and strategically placed water molecules. He was a tireless advocate for pursuing protein structures at the highest possible resolution, believing that key details of their chemistry would be revealed, but he also came strongly to the view that other approaches would provide complementary information, most notably molecular calculations.

Although he avoided the formalities of administration and undergraduate teaching as much as he could – in the process generating some legendary stories – he committed his full reserves of energy and persuasion into matters he thought were important for the community at large. As Chair of the IUCr Commission on Biological Molecules he led the way in establishing criteria for the deposition and release of both the data and the coordinates for biological structures, driven by the belief that they should be available to all. He campaigned tirelessly on issues such as the location of the Diamond Synchrotron and the NIMR. His wisdom and lack of personal agendas saw him widely sought as a reviewer and a PhD examiner. He had very high standards, but he understood human fallibilities.

Guy liked to say that he had never grown up, and there is some truth in this. He retained a boyish enthusiasm, and his love of life was infectious. He could be describing the exquisite beauty of the catalytic triad in serine hydrolases one moment and be bowling tricky leg-spinners down the laboratory corridor the next. A typical comment from a young researcher in my laboratory sums up his personal legacy: ‘Though I met him only a few times I was always struck by his passion for both life in general and science in particular, as well as what I saw as a mischievous twinkle in his eye and his approachableness. I always came away from talking to him with renewed enthusiasm’.

Guy always saw the best in people, and as a result he got the best from them. Today, researchers all round the world, from the UK and Europe, to North America, Cuba, India, China, Australia and New Zealand – including Zbyszek Dauter and I, joint editors of this journal – carry the benefits of their associations with Guy and an abiding and affectionate love for him.

E. N. Baker
School of Biological Sciences, University of Auckland, New Zealand