Peter B. Dews (1922–2012)

Peter B. Dews is generally regarded as the ‘father’ of behavioural pharmacology and is especially famous for his early interactions with B. F. Skinner and the introduction of quantitative measurement to the discipline in the 1950s. He was British, being born in Yorkshire, and undertook early medical training at the University of Leeds. He worked under well-known pharmacologists in the UK such as Bain (Leeds), Burn (Oxford) and Gaddum (Manchester) before moving to the US on a Burroughs-Wellcome research fellowship to their facility in New York City where he produced his first major (and most cited) paper (Dews, 1953) on effects of amphetamine, nicotine, cocaine and other drugs on motor activity in mice. He then obtained a PhD at the University of Minnesota and worked at the Mayo Clinic, where he gained his tremendous expertise in statistics.

His career took a major step forwards when he moved to Otto Krayer’s Department at Harvard, at which point his academic globe-trotting ceased and he spent the rest of his career developing what was to become an eminent laboratory there under his overall direction. His most influential visits to the experimental psychology laboratories at Harvard of Skinner and C. B. Ferster led to the invention of a new paradigm in behavioural pharmacology, which depended on the use of objectively measuring the patterning of operant behaviour over time, as controlled by defined schedules of reinforcement. This paradigm suited Dews’ theoretical perspective, as a physiologist and pharmacologist, rather than an experimental psychologist per se. It allowed him to measure the time-course of drug action and quantify its magnitude. As a ‘no-nonsense’ Yorkshireman he was cautious in dealing with concepts such as ‘attention’, ‘emotion’ and ‘memory’, preferring, perhaps wisely, to avoid everyday notions of these constructs, which he was acutely aware could lead to unintentional ambiguity and misunderstandings.

His own major contributions to the field came with the publication in the *Journal of Pharmacology and Experimental Therapeutics* of a series of largely single-authored articles on the effects of a range of drugs on operant behaviour in pigeons (Dews, 1955, 1958). From these, emerged the principle of rate-dependency, akin to the Law of Initial Values derived from autonomic physiology, which simply re-stated the concept that the behavioural effects of drugs often depended on the baseline rate of responding. This was often a useful corrective to more ambitious, but speculative clinical interpretations of whatever psychological process the drug might otherwise be assumed to be affecting. This concept of rate-dependency, while not always to the fore in modern neuroscience, has survived as an influential principle that may ultimately be shown to have a profound neurochemical or neurophysiological basis, in terms of underlying mechanisms.

This more abstract and original conceptualization of drug effects certainly influenced my own thinking about how stimulant drugs such as amphetamine affected behaviour, for example, in the context of their ‘paradoxical’ actions in attention deficit/hyperactivity disorder. Hence, at the recommendation of Susan Iversen, who had previously worked post-doctorally at the Harvard laboratory, I was delighted to be accepted as a visiting Research Fellow for a period in 1976. The group that Dews had assembled by then was impressive, having been strengthened by the recruitment of R. T. Kelleher and W. H. Morse, as well as a number of highly talented although more junior colleagues. At that point, the laboratory was perhaps the major hub for the discipline, training many influential investigators and including an important laboratory extension to the New England Regional Primate Research Centre. Major findings included the phenomenon of response-produced shock, which overturned many conventional notions about motivation, and the introduction of so-called ‘second-order’ schedules of reinforcement as models of drug-seeking behaviour, relevant to substance abuse and addiction.

Susan had told me that this group was brilliant at actually designing and carrying out experiments and I saw plenty of evidence of that during my stay, as well as being able to interact with Peter on a personal level.
I learned of course that he was a highly original thinker, who, despite his sometimes bluff and gruff manner, also much enjoyed the social aspects of science and was a highly entertaining raconteur. I was mildly surprised to find that his scientific interests extended much more widely than I had realized. For example, he had developed a procedure for measuring visual discrimination in mice using an automated maze, which was years ahead of his time (to go with his uncanny predictions that mice would be the first choice model organism for genetics in years to come). He was also of course deeply involved in the early scientific development of the important science of behavioural toxicology, which was to see considerable expansion in the USA in the 1970s.

Peter’s general character and approach can perhaps be encapsulated in a few of his typically down-to-earth comments and a chance meeting we had. I recall, as a young scientist, coming across his pithy bulletin on the progress of a chapter he was preparing for the prestigious Handbook of Psychopharmacology; ‘We’ve torn it all up and started all over again; now making good progress’. Message – do not be afraid to admit mistakes and make a fresh start! And again: ‘I don’t like to work in areas that are too popular’. Message – avoid trends for the sake of them and stick to your own original interests – they may do you greater scientific credit!

I well recall meeting him in the queue at Gatwick airport, London, to board one of the first pioneering cut-price Freddie Laker flights, bound for New York; dressed practically in his anorak, with his sandwiches freshly prepared for this ‘no-frills’ airline trip. This was a development in air travel, custom-made for Peter! In fact, at the other end of this particular trip he displayed great kindness, as well as typical common-sense resourcefulness, in conveying my future wife, Barbara Sahakian, and me safely to Boston by road in a hired car in the middle of a snowstorm.

We were delighted at our Department of Experimental Psychology at Cambridge (with Barry Everitt, Tony Dickinson, Nick Mackintosh and others) to host Peter as a sabbatical visitor in the mid-1990s. He charmed and impressed everyone, including PhD students, especially by his tendency to come up with original and entertaining comments and reflections. He was pleased, I think, to see that many of the psychological processes he had previously eschewed could by then be addressed largely using the operant conditioning methods he had himself introduced. At any rate, a copy of a large poster summarizing the results of his rate-dependency experiments with a large photo of the man himself has found a permanent niche in our current laboratory and his influence continues to be evident.

References

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