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D. R. Cox: Extracts From a Memorial Lecture

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In August 2022, Nancy Reid, Peter McCullagh, and I delivered memorial lectures at the Joint Statistical Meetings in Washington, DC. A full transcript of my lecture, published in the *JSM Proceedings* (Battey, 2022), covers aspects of David's character and intellect as I perceived them during the happy years we worked together. The present note contains extracts, respecting limitations on space.

David was a pioneer of modern statistical theory, an applied probabilist of a stylishly old-fashioned kind, and a wise authority on almost all things scientific. His mathematical and scientific artistry, appealing to an aesthetic sensibility, contributed to a sense of intellectual delight. He was delightful in other ways too.

David had an understated sense of humor; a kind of mild-mannered satire that teetered on the boundary between seriousness and absurdity. This was perhaps enhanced by the fact that sometimes what seemed nonsense was actually true, so that it wasn't always possible to tell when he was joking. He told me more than once, with a characteristic mischievous delight, that *Biometrika* used to send telegrams to referees informing them that they were one day late! Telegrams were usually reserved for when a parent or other close relative had died, so you can imagine that the poor malingerers might have found this quite alarming. When he once invited me to a dinner he had to attend he warned in writing, "It will be a relatively absurdly formal affair: The Queen, then individual guests say 2 sentences about who they are." I was left asking myself which was more likely: that he was ridiculing the formality of the occasion; or that the Royal Statistical Society would treat the Queen to an evening at a pseudo-French chain restaurant next to Southbank's Pizza Express. The latter is just on the borderline of plausibility and the joke is overdetermined, as readers of Freud might appreciate.

I mention that because David was one such reader. He was quite convinced by some of the old psychology literature, not only by Freud but also the mathematician Jacques Hadamard's psychology writings.

In the recommended material, Freud (1987, 2002, 2005) claims that:

- Unlike the conscious, the unconscious is not constrained by logical consistency.
- Traces of it manifest through dreams and through jokes or wit, and the two have some commonality:
  - both use an absurd form of representation;
  - both use extreme condensation; they are overdetermined in the sense that the unconscious selects the nodal points at which several or many ideas intersect.

Hadamard (1944; based also on writing by Poincaré) claims that:

- The manifold nature of the unconscious enables it to carry out a work of synthesis.
- Being unconstrained by logic, it tries seemingly incongruous combinations of ideas.

According to Hadamard, this is why one can wake up one morning knowing how to proceed with a problem, having been stuck with it for a long time previously. David was convinced by that (as am I), although this

literature is not as scientific as the things we are used to reading.

- So-called intuitive types of mathematician appear to make more use of the unconscious and are less inclined toward formal proof than ‘logical types.’

Hadamard gives examples of mathematicians and mathematical scientists of both types, all highly esteemed. His description of the archetypal intuitive closely resembles R.A. Fisher: an enigma who could write down an answer seemingly from nowhere, without regard for regularity conditions. David published a historical paper in 2016 that included the following secondhand quote about Fisher:

> The explicit statement of a rigorous argument interested him, but only on the important condition that such explicit demonstration of rigour was needed. Mechanical drill in the technique of rigorous statement was abhorrent to him, […] partly as an inhibition to the active use of the mind. He felt it was more important to think actively, even at the expense of occasional errors from which an alert intelligence would soon recover, than to proceed with perfect safety at a snail’s pace.

Anyone who has read Nancy’s *Statistical Science* interview (Reid, 1994) will recognize that David was also of this ilk. For instance (Reid, 1994, p. 445):

> The mathematicians make a great hoohaa about setting up such a function, but it’s physically absolutely obvious that such a thing uniquely defines a point process and it takes half a sentence to say so.

On one occasion he even got away with writing, in what I assume was an invited paper (Cox, 2000):

> We assume throughout what are known in some quarters as the British regularity conditions.

It seemed to me that there was a healthy symbiosis: on the one hand David’s unique way of thinking, his extraordinary intuition and artistic style of applied mathematics; then others coming along afterwards to build on it and put it on a more rigorous basis.

David was gentle, helpful, and kind with everyone, but he had firm views, and a particular taste in scientific work. The result of this combination was that sometimes his true opinion was lost in translation. If he described any of my notes as “impressive” I knew to seek the nearest wastepaper basket, as labeled data from other contexts suggested this either meant ‘probably clever but totally misguided’ or ‘it can’t be this complicated.’ He would occasionally tell authors their work was “impressively wide ranging” before subtly and helpfully explaining how they should have done it. Genuine approval was, however, enthusiastically expressed. His feedback to others, just like his own work, abounded with understated profundities.

David was wonderful to work with. We had a close and special friendship too: whimsical, I suppose you might say, subtly humorous; but also poignant, fragile. I am told that David orchestrated parts of his very modest funeral and what-not, which didn’t surprise me because he hated pompous ceremony. In my case, he was less

explicit on the topic. He used, I think, the Freudian overdetermined trick, so that his words, and their slightly wistful delivery, took on one sometimes rather mundane meaning while he was alive, and a great deal more profundity when he was gone. The challenge was to reply in a similar vein, so that we both said nothing and everything at the same time. And for good measure, he'd sometimes add "don't forget."

https://youtu.be/lq8DrgkZlYE?t=940 15:40–15:47 (7 seconds).

https://youtu.be/opbBjIj-LUE?t=1673 27:50–29:25 (1 minute, 35 seconds).

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