

OUT OF HOURS Christopher Martyn

## Fighting a lost cause?

Shifts in meaning are common enough in everyday language, but there is a case for resisting such change with respect to technical concepts. The Bradford Hill “criteria” are one example

Words can change their meaning by 180 degrees in a remarkably short space of time. Not long ago “prestigious” meant tricky or deceitful; “sophisticated” meant adulterated or falsified; and “peruse” meant to read carefully. The same is true of technical terms. Quintile and quartile, once labels for the cut points that divided a frequency distribution, are now used, even in the *BMJ*, to mean portions of the data. Which is odd, really, as perfectly clear and unambiguous words, “fifth” and “quarter,” already exist for that purpose. I suppose that “quintile” and “quartile” must seem cleverer or more scientific, rather as some writers use “epicentre” when they mean centre, a pointless hyperbole implying that there’s something even closer to the centre than the centre itself. But there’s no point in objecting, however much you regret the change. A word’s current meaning resides in the way it’s currently used, and there’s an end of it.

I do feel a bit sorry, though, for authors who have written a line or phrase that is resonant enough to pass into everyday language, only to find that the intended meaning has been corrupted by the transition. The poet Arthur O’Shaughnessy wrote:

“We are the music-makers,  
And we are the dreamers of  
dreams [ . . . ]

Yet we are the movers and shakers  
Of the world for ever, it seems.”

Although it is pretty obvious that he was trying to articulate the paradoxical idea that the sorts of people who actually change the world are unworldly dreamers, the phrase “movers and shakers” is now applied to assertive, high achieving, ambitious people who have reached the top of their professions. Time has been even crueller to Sydney Smith, the 18th century clergyman and wit who once derided someone by describing their

idea of heaven as “eating pâté de foie gras to the sound of trumpets”—a put down that seems more crushing the more you think about it—only to have posterity misremember the bon mot as his own view of eternal bliss.

Something similar happened to Austin Bradford Hill, an epidemiologist and statistician who pioneered randomised controlled trials. In October 1964 he was invited to give a lecture at the first meeting of the newly formed Section of Occupational Medicine of the Royal Society of Medicine. Hill was 67 years old at the time, retired and professor emeritus. The organisers probably chose him as a suitably senior and eminent speaker for their inaugural meeting. Whether Hill was pleased to be asked is anyone’s guess. Maybe he tried to get out of it but couldn’t think of an excuse. Perhaps he scratched his head wondering what he might talk about. Anyway, he accepted the invitation and spoke about the problem of deciding whether an observed association between exposure to an environmental variable and occurrence of disease can be taken as indicating causality. We know this because the lecture was later written up and published in the *Proceedings of the Royal Society of Medicine* (1965;58:295-300); it may not have quite the tone of an after dinner speech, but it certainly reads like something that started out as a script rather than as an article for a learned journal.

He starts the lecture by sidestepping any philosophical discussion of what causality means and makes it clear that he’s concerned with interpreting observational evidence in the pragmatic context of having to make a decision about whether action is needed. He then discusses what aspects need to be considered when trying to judge whether an association



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is causal: its strength, its consistency, its specificity, and so on. There isn’t space to summarise the lecture here, but it’s well worth reading and is available online ([www.edwardtufte.com/tufte/hill](http://www.edwardtufte.com/tufte/hill)). Underlying his consideration of these individual points is the theme that assessing causality is necessarily provisional: partly because it’s usually based on incomplete evidence but also because there’s no foolproof system of logic that allows the inference of causality. He gives counterexamples to emphasise that associations can turn out to represent cause and effect even when they aren’t strong, consistent, or specific; and, just in case the audience hadn’t got the point, he ends by saying: “I do not believe . . . that we can usefully lay down some hard-and-fast rules of evidence that must be obeyed before we can accept cause and effect. None of my nine viewpoints can bring indisputable evidence for or against the cause-and-effect hypothesis and none can be required as a *sine qua non*.”

Despite its unusual origins the paper is often cited, although it’s hard to believe that many of the people who do so have actually perused it. The nine viewpoints are invariably referred to as the Bradford Hill criteria—a phrase that implies exactly the opposite of Hill’s intended message. And authors who grind through them trying to show that the association they’ve observed ticks enough boxes to be considered causal have missed his central point: that no formula exists that can reliably be applied to establish (or refute) the presence of a cause and effect relation and that each case must be thought about individually and with regard to the practical consequences that follow. **Christopher Martyn is an associate editor, *BMJ* [cmartyn@bmj.com](mailto:cmartyn@bmj.com)**

Cite this as: *BMJ* 2009;338:b1621