

BOOK REVIEWS

The Burt Affair by R. B. Johnson. Routledge, 1989, 400 pp. \$35.00.

Science, Ideology and the Media: The Cyril Burt Scandal by R. Fletcher. Transaction Pubs., 1990, 196 pp, \$29.95.

A famous quotation attributed to the British physicist, Ernest Rutherford, is "If an experiment requires statistical analyses to establish a result, then one should do a better experiment." Rutherford is, of course, both right and wrong. The mark of the successful classical physicist was the ability to devise the definitive, *deterministic*, repeatable experiment which settled an issue beyond doubt. But not everything falls in the realm of classical physics and when variation exists, statistical analysis is unavoidable. In fact, so wide-spread has statistics become that it is hard to get a degree in business, biology, the social sciences, education, agriculture or of course, physics, without taking at least a course in statistics. To use an evocative phrase now popular: statistics is our way of taming uncertainty.

Unfortunately, there is a lot of uncertainty out and about, particularly when it comes to the seemingly endless nature vs. nurture debate, the hereditarians vs. the environmentalists. Unlike one's eye color which is clearly an effect of nature and unlike one's native language which is clearly an effect of nurture, intelligence is a characteristic that is plausibly both nature and nurture. Much blood has been figuratively spilt over the percentage of intelligence attributable to each. Roughly speaking, those comfortable with the economic and cultural *status quo* prefer nature while those who wish to reform the system favor nurture.

Creating an experiment, statistical or otherwise, for definitively settling the issue of nature vs. nurture is virtually impossible. Unlike the Nazis who performed any experiments their degenerate imaginations could conjure up, our civilized society doesn't allow us to do what good statistical practice suggests: at birth, separate identical twins and at random deposit each into the general population; at a suitable age measure intelligence. Identical twins are genetically identical and any similarity in intelligence is entirely due to nature because nurture has been eliminated, as it wouldn't be if the twins were raised together.

It often happens in statistics that when *experimental* studies are impossible, *observational* studies are useful; for example, the evidence linking cigarette smoking with lung cancer is strictly observational based as it is on retrospective data on people who choose or choose not to smoke. With respect to the na-

ture-vs.-nurture controversy, the trick is to find identical twins separated at birth because such people are rare, indeed. The man most identified with finding and testing identical twins separated at birth is Cyril Burt.

During the 1940s, 1950s and 1960s Burt found 15, 42 and eventually a total of 53 separated identical twins, by far the largest collection in the world. He concluded that the correlation coefficient for the I. Q. of these twins was .771 (maximum is 1) so that nature is four times as important as nurture (.771 is close to .8 which is 4/5 of the way from 0 to 1.) His results were often cited by hereditarians as cinching their case; Burt died in the early 1970s having been the first British psychologist to be knighted. Then the roof fell in.

Leon Kamin, at that time a professor at Princeton, in 1972 was the first to raise statistical doubts concerning the three-decimal place invariance of such a notoriously variable quantity as the correlation coefficient, when the number of the separated identical twins increased from 15 to 42 to 53. Kamin was also the first to inquire into the raw basic data itself, such as what kind of I. Q. tests were given, the names, addresses, ages at separation, adopting parents and so on; such data or even indications of where to find such information are virtually absent from Burt's studies.

Two years later, a journalist at the Sunday Times, Oliver Gillie, put things at a level much easier for the public to understand than the invariance of the correlation coefficient. So convincing was Gillie's proof that Miss Howard and Miss Conway, Burt's putative co-authors, were convenient fiction — Burt had a history of using pseudonymous articles to praise himself — that, in 1979, Leslie Hearnshaw, Burt's official biographer, concluded, "Burt was guilty of deception. He falsified the early history of factorial analysis; he produced spurious data on MZ [identical] twins; he fabricated figures of scholastic achievement."

Hearnshaw, an admirer of Burt's early achievements, put the blame for Burt's indiscretions on such later-occurring events as Burt's marriage breakdown, loss of research material during World War II and Ménière's disease (a disease of the inner ear.) In short, psychological, environmental and physical circumstances brought about a general deterioration in Burt's ability to separate the real world from the one he was fabricating. And that should be that.

But not forever. If Richard Nixon can rise from the ashes twice, perhaps it isn't so surprising that Cyril Burt can be resurrected. Two independent books came out recently claiming (according to Science) that Burt "may have gotten a bum rap." Robert B. Joynson's *The Burt Affair* and Ronald Fletcher's *Science, Ideology and the Media*, while quite different in tone tried to set the record straight. The former author ingenuously says of himself, "he had no position to defend on the question of inheritance of intelligence" before he began his investigation; the latter constructs his argument the way a feisty defense attorney would, by hammering away at those who unfairly accuse his client.

Neither Joynson nor Fletcher is very convincing as they try to show that Miss Howard and Miss Conway may have emigrated to Australia or Canada which weren't keeping records at that time. Or that rather than fraud, Burt is

guilty only of sloppiness in reprinting tables from a previous publication while in the body of the text referring to an increase in the number of twins.

The real villain in all of this is not so much Burt or his apologists but those who found his results so to their liking that they accepted them unquestioningly for so many years. These people now have a new focus of attention, the Minnesota Study of Twins Reared Apart, partly because Burt is still too hot to handle and partly because this study now has more than Burt's 53 pairs. Many papers have resulted from this research group but they are long on anecdotes and short on details concerning age of separation, age at reunion, who actually reared them — as amazing as it sounds, in previous (relatively small but nevertheless, actual) studies of separated, identical twins, many of the twins were never really separated but sometimes it is doubtful that they were identical and not fraternal! Furthermore, the raw data is not freely available to researchers who have a different agenda. And just to make the reader more skeptical, one of the main financial supporters is an organization with a clear racist intent.

One last point stressed by Kamin which is often overlooked as the nature-nurture proponents swap statistical and often highly technical attacks is the vital issue: should we be doing these studies at all? Intelligence is a very incendiary topic and bound to be misinterpreted no matter how carefully phrased in the antiseptic prose of statistics. There are some areas where science should not tread. That goes for statistics as well.

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The Left-Hander Syndrome; The Causes and Consequences of Left-Handedness by Stanley Coren. New York, NY: Free Press, 1992, 308 pp. \$24.95 (paper).

Frankly, we aren't fond of lefties. By "we" I refer to my well-over-forty squash buddies who are properly annoyed when a southpaw opponent forces us to play in a mirror-image manner. Instead of playing by instinct, we consciously have to reverse the court in which we start serving, reverse shot placements, etc. Besides, there is the nagging doubt that if your opponent can play so well left-handed, just imagine how much better he must be when using his right hand.

A larger "we" is the predominantly right-handed world designed by and for the overwhelming majority of us. Can openers, work benches, computer keypads, soup ladles and scissors are just a few of the implements most of us don't realize are inherently anti-left-handedness. As Stanley Coren in his book, *The*