IQ and science: the mysterious Burt affair

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THE CASE OF Sir Cyril Burt is probably the most bizarre episode in the entire history of academic psychology. This can be attributed to a combination of elements—the controversial subject of Burt's major research, his unusual personality, his widely acknowledged accomplishments, and the damaging accusations leveled against him after his death. Indeed, Burt's posthumous notoriety exceeds even the considerable fame he enjoyed during his long career.

In his famous study of the IQs of fifty-three pairs of MZA twins—monozygotic (identical) twins reared apart—Burt had shown a high correlation (.77) between the general intelligence of separately raised twins. What became known as the "Burt scandal" surfaced in 1976, five years after Burt's death. The psychologist was accused of faking data and fabricating both research assistants and co-authors to lend his deception authenticity. The main thrust of the attackers' effort was to discredit Burt's major theory—that genetic factors are strongly involved in human intelligence—as well as the body of research that supports it. Still, Burt was not without his defenders. A number of scholars, mainly former asso-

ciates, rose to his defense, writing articles and letters to newspapers and making television appearances. The controversy continued for three years.

Then, in 1979, Burt's guilt was virtually clinched when Britain's most highly respected historian of psychology, Leslie Hearnshaw, published *Cyril Burt, Psychologist*, which appeared to be a carefully researched and impartial biography of Burt. Hearnshaw had exclusive access to Burt's private correspondence and diaries, which no one else had yet seen. Thus, the biography was almost universally accepted as the last word on the subject and even persuaded most of Burt's supporters. The devastation of Burt's once exalted reputation was a gleeful triumph to his detractors and a tragedy to his admirers. With sighs of relief all around, the matter appeared to be settled at last. Or so most of us thought.

Recently, the investigative efforts of two British scholars, psychologist Robert B. Joynson and sociologist Ronald Fletcher, have reopened the case. Neither man knew Burt personally or ever had any previous connection with Burt's research or the "IQ controversy." The two investigators, working entirely independently, devoted several years to carrying out what appears to be painstaking detective work on the Burt affair. Both Joynson's 1989 book, *The Burt Affair*, and Fletcher's 1991 work, *Science, Ideology, and the Media: The Cyril Burt Scandal*, critically question every accusation and meticulously sift through the evidence. Although their accounts differ markedly in organization and style, with regard to the main charges against Burt the two authors reach the same conclusion: *not proven*.

A brilliant eccentric

Before getting into the details of this perplexing case, it is important to know just who Burt was, personally and professionally. Certain features of Burt's personality, and especially his area of research, helped the scandal sprout and flourish.

Sir Cyril Lodovic Burt (1883-1971) was long regarded as a towering figure in the history of British psychology. The first British psychologist to be knighted (a distinction bestowed on only two other psychologists to date), Burt was renowned for his intellectual brilliance and scholarly industry. After graduating from Oxford University, where he studied classics, mathematics, physiology, and psychology, Burt worked for four years as an assistant to the

celebrated neurophysiologist Sir Charles Sherrington at Liverpool University. Following a stint as a lecturer in experimental psychology at Cambridge, he went to work for the London County Council in 1913. This job put Burt in charge of psychological research and applied psychology, including the development of mental and scholastic tests, for the entire London school system. In this setting he became one of the world's leading educational psychologists and psychometricians, developing new tests, conducting surveys, and founding child guidance clinics and a special school for the handicapped. Burt conducted pioneering research on juvenile delinquency and mental retardation. He reported some of these studies in beautifully written books that became classics in their field: *The Young Delinquent* (1925), *The Subnormal Mind* (1935), and *The Backward Child* (1937).

During much of the period that Burt held his appointment with the London County Council, he also occupied the chair in educational psychology at the University of London. In 1932, when Charles Spearman, one of the great pioneers of mental testing, retired as head of the Department of Psychology at University College, London, Burt was appointed to his position, probably the most influential in British psychology.

Burt retired from that post in 1950, at the age of sixty-eight. The last twenty years of his life were spent in a rather reclusive manner, living in a large London flat with a secretary-housekeeper, editing journals, and writing books and articles. He was remarkably prolific even in his old age. Following his retirement he published over 200 articles and reviews. And those were only the items published under his own name. In addition, as his most notable eccentricity, he wrote a considerable number of articles, mostly book reviews, under various pseudonyms or initials of unidentifiable names. He worked steadily almost until the day he died, at the age of eighty-eight.

The two areas of research for which Burt was best known were factor analysis and the genetics of intelligence, fields in which his mathematical aptitude could be used to great advantage. In both fields, Burt's work was ground-breaking. He expertly adapted new developments in quantitative genetics to the study of human behavioral traits. Kinship correlations are the essential data for quantitative genetic analysis. Beginning quite early in his career, while still working in the London schools, Burt started collecting IQ and

scholastic-achievement scores on twins and various other related groups. Between the years 1943 and 1966 he published many theoretical and empirical studies dealing with the inheritance of intelligence; another paper was published posthumously in 1972.

It was particularly this genetic aspect of Burt's psychometric studies of individual differences that seemed to have such controversial educational and social implications. Egalitarian intellectuals tended to view the so-called "nature-nurture" question as a political issue rather than a scientific one, and so the potential controversy extended to a much larger arena than just the field of behavioral genetics. Burt himself, however, seldom expressed any interest in politics and never joined any political party. His knighthood was awarded by a Labour government.

Burt's personality is a more puzzling matter. I knew Burt personally and enjoyed numerous visits with him in the last two years of his life. But it was obvious to Burt that I was an admirer, and probably his relationship to me, always friendly and generous, was not entirely typical of his dealings with his academic colleagues or students. Opinions of Burt vary widely among this group, ranging from the highest esteem to bitter denigration, at times both coming from the same observer. There are only three characteristics about which one finds complete agreement: Burt's exceptional intellectual brilliance, his extraordinary general erudition, and his untiring industry.

The less favorable impressions of Burt registered by a few of his former students, colleagues, and acquaintances mention his egocentrism and personal vanity, his autocratic manner in running his department, his insistence on getting his own way, and his obsessive need to have the last word in any argument. Also, as a noted colleague, Philip E. Vernon, wrote, "It seemed difficult for him to allow his past students or followers to branch out and publish contributions which went beyond his views." Added Vernon, "Although Burt gave immense amounts of help to students and others, he could not brook any opposition to his views, and often showed paranoiac tendencies in his relations with colleagues and critics."

Disappearing data

Perhaps the only means by which to evaluate Burt objectively is to judge him by the published work he left behind. His strictly theoretical work on factor analysis and on the polygenic theory of

intelligence was an important contribution to the field; it provided a heuristic methodology for the study of individual differences that many other researchers applied in subsequent studies. The reliability of Burt's empirical research, by contrast, has frequently been called into question.

A few days after the news of Burt's death in 1971, I wrote to Miss Gretl Archer, who was Burt's private secretary for over twenty years, to request that she preserve the two or three tea crates of old raw data that Burt had once told me he still possessed. I told Miss Archer that I would travel to London the following summer to go through this material. I supposed it included IQ test data on twins, in which I had an interest and which I thought could be used in certain newer kinds of genetic analysis that Burt had not attempted. Miss Archer replied that all of these data had been destroyed within days after Burt's death, on the advice of Dr. Liam Hudson, professor of educational psychology at Edinburgh University. He had come to Burt's home soon after the announcement of Burt's death. Miss Archer, distraught and anxious to vacate Burt's large and expensive flat in Hampstead, had already arranged for the disposition of Burt's library and correspondence files (which were turned over to his biographer, Hearnshaw), but expressed concern to Hudson about what to do with these boxes of old data. Hudson looked over their contents and advised that she burn them, as being no longer of any value. Miss Archer said she believed the boxes included the data on twins, and later expressed regret that she had acted on Hudson's advice. The account I received from Miss Archer of this event was corroborated by Hudson himself, in a 1976 interview with *Science* staff writer Nicholas Wade. Hudson explained that he thought Burt's old data sheets were probably unintelligible to anyone but Burt himself.

I was absolutely flabbergasted when I received this news of the destruction of whatever was left of Burt's data. I was especially shocked because it was obvious that, although Miss Archer knew that Hudson was a professor at Edinburgh, she had no idea that he was one of Burt's most ardent anti-hereditarian opponents. I had met Hudson in 1970 at Cambridge University in a debate for which he had been selected by the sponsors to oppose my position (and Burt's) regarding the heritability of intelligence. Hudson later published a book, *The Cult of the Fact* (1972), in which the "bad guys" are hereditarians, including Sir Francis Galton, Spearman, Burt,

Hans Eysenck, and myself. Hudson's rush to Burt's flat right after his death and his advice to Miss Archer to burn the stored data seem stranger than fiction, among the more bizarre events in the whole Burt affair.

Accusations of fraud

The first public accusation of outright fraud appeared on October 24, 1976 in the London *Sunday Times*, under the striking headline: "Crucial Data Was Faked by Eminent Psychologist," written by Oliver Gillie, the *Times*'s medical correspondent. Within days the story was repeated in the mass media around the world. Gillie followed with other sensational articles under headlines such as "The Great IQ Fraud" and "The Scandal and the Cover-Up," writing of "outright fraud," and calling Burt a "plagiarist of long standing."

These charges were not based on anything new involving Burt's data, certain peculiarities of which I had already pointed out two years earlier in an article in *Behavioral Genetics*. Gillie's allegations rested solely on the claim that he had been unable either to locate in person or to find any trace of two women—Margaret Howard and J. Conway—who were credited with assisting Burt in his research on twins. Howard was a co-author of one of Burt's most important articles on twins and Conway was named as the sole author of an article that was actually written by Burt himself, according to his secretary. These two women could not be traced or even identified with certainty by anyone available for questioning who had been associated with Burt. The "missing ladies," as Gillie called them, gave him licence to claim that Burt's data were, as he put it, "faked."

Gillie credited Professor Jack Tizard (since deceased, but then a psychologist at London University's Institute of Education) with helping him search for the "missing ladies." Tizard, although he had scarcely known Burt personally, became an active participant in the attack, giving Gillie information and advice on how to go about it.

I was well acquainted with Tizard, having spent two years at London University's Psychology Department, where he also taught at the time. He was, as his wife explained to Joynson, a "passionate

egalitarian." Tizard was also quite outspokenly anti-hereditarian and anti-Burtian.†

The day after Gillie's sensational charges of fraud in the *Sunday Times*, there appeared in the *Times* an interview with Tizard, titled "Theories of IQ pioneer 'completely discredited.'" It began: "The theory of Sir Cyril Burt ... that man's intelligence is largely caused by heredity was now completely discredited, Professor Jack Tizard, Professor of Child Development at London University, said yesterday.... Professor Tizard said the discrediting of Burt's work cast doubt on his whole line of inquiry."

It seems highly likely that the main steam behind the attack on Burt may have been the fervent wish of environmentalists such as Tizard to discredit the theory of polygenic inheritance of mental ability and other behavioral traits of obvious personal, educational, and social importance. Such indeed was the leitmotif in the popular press and on television, both in England and America. (It even predominates in accounts of Burt in some psychology textbooks.) Since ideological propaganda depends not on facts, but on images, impressions, and prejudices, the anti-Burt campaign naturally avoided the fact that Burt's research was in line with the consensus of other expert studies on the heritability of IQ.

Hearnshaw's biography

When the scandal broke in the media, it was already known in psychological circles that Professor Hearnshaw had been working for several years on what would become the "official" biography of Burt. Because of Hearnshaw's well-recognized scholarly credentials as an historian of psychology, and the fact that he had no prior involvement in the IQ controversy or in any other aspect of Burt's activity, his objectivity and credibility in the Burt case were unblemished. Also, he had delivered a beautiful eulogy at Burt's memorial service and was commissioned to write the biography by Burt's sister, who made available Burt's diaries and correspon-

†Over the following years, I saw Tizard occasionally on my visits to London. On one such occasion, before Gillie's exposé of Burt, I asked Tizard if he knew anything about Burt's assistants, Howard and Conway. When I mentioned that I had not yet come across anyone who knew anything about these women, except for having seen their names in Burt's articles, Tizard's eyes lit up. He excitedly said something to the effect that perhaps these women never existed at all and loudly clapped his hands. His exclamation still rings vividly in my memory: "Wouldn't it be great if it could be shown that Burt was really just an old fraud!"

dence. It was everyone's reasonable expectation that Hearnshaw's forthcoming biography of Burt would become generally regarded as the last word on the matter.

Although Hearnshaw was already in the late stages of his writing, it was of course mandatory that his biography deal fully with the scandal. Several of Burt's detractors grabbed this opportunity and made further accusations that had not previously come to light. The most curiously assiduous in this effort were two psychologists at Hull University, Alan and Ann Clarke (husband and wife), both of whom got their Ph.D.'s under Burt back in 1950. They asserted that Burt had written and published articles based on their doctoral dissertations—using their names but with the conclusions "slanted" to serve his own purposes. This accusation further encouraged doubts about Burt's integrity. The Clarkes called Burt "unscrupulous," a "rogue," a "con man," and a "fraud." They repeated this charge many times in articles and on BBC radio. Hearnshaw seemingly accepted this defamatory claim at face value, without verifying it, and incorporated it wholesale into his biography as a flagrant example of Burt's devious character.

Burt's detractors were obviously successful in convincing Hearnshaw of Burt's guilt. When his massive and well-written biography was published in 1979, his conclusions of guilt on several counts were widely accepted, even by most of Burt's former defenders. The Council of the British Psychological Society (BPS) endorsed Hearnshaw's conclusions and officially declared Burt's guilt in a 1980 booklet entitled *A Balance Sheet on Burt*. The "balance sheet," however, was anything but balanced. Both Tizard and Alan Clarke were members of the BPS Council when it planned its official pronouncement on Burt. Among the seven presenters in the *Balance Sheet* were Hearnshaw, Gillie, Ann Clarke, and Alan Clarke. As expected, they all roundly condemned Burt, while the remaining three contributors, who had never visibly done any research on the Burt affair themselves, acquiesced in the official pronouncement and wrote only in general terms on research methodology and scientific fraud. As far as I know, there was no attempt to question any of the evidence used to support the various charges against Burt.

Why were so many so convinced by Hearnshaw's book? I had reviewed the manuscript for the publisher and praised it highly. Its cool-headed, judicious style evinced none of the rancor or anti-

hereditarian rhetoric typical of Burt's detractors. What seemed to be the crucial evidence in Hearnshaw's exclusive possession were Burt's diaries and correspondence. The diaries covered the much-examined period in Burt's career (1953-1960) during which he published articles suggesting that he had acquired data on new sets of twins. Hearnshaw gives the impression that the diaries were quite complete and detailed, recording even such insignificant things as Burt's having tea with a friend, taking a walk, or getting a haircut. Surely one would think that anything as important as locating and testing newly discovered sets of MZA twins would be mentioned in the diary, if this had actually occurred. Their complete absence in the diaries would seem to be damning evidence.

However, when the diaries are closely examined, as they were by Joynson and by Fletcher (whose book also reproduces all the entries in Burt's diary for one month), this negative evidence of not having collected any new sets of twins (at least after 1953) suddenly becomes unimpressive. The reason is that Burt's diaries seem to record *nothing* but utter trivia; for example, there is no mention at all of the death of Burt's personal secretary of many years or of Burt's attending her funeral, which other records show he did. The diaries read more like a simple date book, with the briefest possible notations. Furthermore, some 55 percent of all the dates during the whole period covered by the diaries show no entries at all, and there are a number of periods of several consecutive months without a single entry. So the absence of entries on MZAs (or other kinship data) in the diaries, and the lack of any mention of his former assistants, Howard and Conway, become unconvincing evidence for the charge that Burt faked his data. Yet Hearnshaw's rather misleading report of the nature of these diaries had finally convinced almost everyone that Burt had committed fraud.

The nearest thing to a "smoking gun" in Burt's diaries is the single entry, "calculating data on twins for Jencks." This item does give the reader pause. In 1968, Christopher Jencks, a Harvard sociologist, had requested from Burt a listing of the IQs and socioeconomic ratings of each of the fifty-three MZA twin pairs on which the correlations were based in an important article Burt published in 1966. The crucial question here is: Does "calculating data" mean deliberately *concocting* data to fit the already published correlations and other statistics? Or could it mean something else, perhaps just assembling data from various other tables or test

sheets, or matching up the socioeconomic information on the subjects from separate data files? No one really knows. There is indisputable evidence from Burt's correspondence that he told "white lies" to Jencks and other correspondents about the reasons for his delayed replies to their inquiries (such as claiming to have been out of town), but this can hardly be construed as evidence that he fabricated the MZA data he sent to them.

Another source of suspicion is the fact that Burt wrote in 1971 to Sandra Scarr, a noted behavioral geneticist then at the University of Minnesota, in reply to her request for a copy of his data on fifty-three sets of MZA twins. In his letter, he also gave the IQ scores and other details on three new sets of MZA twins. (Scarr had sent me a copy of this letter, which I passed on to Hearnshaw.) I was especially puzzled by this, because about two months after Burt wrote that letter, I had personally discussed twin research with him, and had even mentioned the possibility of looking for more sets of MZAs in London. Yet he never mentioned having found the three new sets of twins he had described to Scarr. It seems improbable to me to attribute Burt's silence on this point to a lapse of memory. Although he was then eighty-eight years old, his memory was phenomenal for a great many other things, including the technical details of one of my own studies that I had described in conversations with him two weeks previously. Again, however, Burt's failure to mention the three new sets of twins to anyone but Scarr remains negative evidence—apparently damning, but still inconclusive.

The case for the defense

It is impossible in this brief account to do justice either to the great wealth of detail in Hearnshaw's biography or to the extensive and fine-grained investigation presented by Burt's defenders, Joynson and Fletcher. Consequently, the case for the defense can only be characterized in the most general terms. The line of defense argued by Joynson and Fletcher consists of two main tactics: (1) They show the previously unsuspected flimsiness, misrepresentation, and even in some cases factual nonexistence, of the supposedly damning evidence; and (2) They closely examine the points that had aroused suspicion and provide alternative innocent explanations that seem at least as plausible as the "guilty" explanations promoted by Burt's accusers. For example:

Point One. Burt's assistants Howard and Conway could not be found, nor could their existence at any time be definitely established.

Counterpoint. Howard and Conway presumably worked for Burt only prior to World War II and, assuming they were still alive when sought in 1976, they would have been quite elderly. Burt's secretary informed me that Burt had told her that Conway had emigrated, perhaps to Australia. Other persons that Burt mentioned in his articles and who at first were also suspected of being fictitious were later identified. Burt's articles were not explicit about exactly when Howard and Conway actually collected the data on twins, and he was perhaps deceptive in leaving the impression that they were still giving IQ tests to twins even after 1955. My own hunch is that his personal vanity made him want to appear more actively engaged in ongoing research in his old age than he actually was, and so he obscured the "when and how" of his data collection, an implicit deception that later engendered doubts about the data's authenticity.

Point Two. Neither Burt's diaries nor correspondence provide evidence that Burt or any identifiable former assistants tested any new sets of MZA twins after Burt officially retired in 1950. Yet he added new twin data to his studies published in 1955 and again in 1966.

Counterpoint. Virtually all of Burt's data were collected before World War II. After the first blitzkrieg on London, University College had to be rapidly evacuated. All of Burt's data were hastily thrown into various boxes and stored in the basement; his department was moved to Wales for the duration. In a later bombing raid, the College suffered a direct hit. One of Burt's longtime associates, Charlotte Banks, testified that the twin data were retrieved piecemeal after the war. They were found in different boxes and at different times. Some had been misplaced and turned up only much later. Although Burt's articles implicitly made it appear that he was collecting new data, the fact was that he only analyzed and reported for the first time old data that had been collected many years before. Burt's odd furtiveness in this regard justifiably undermined his posthumous reputation; regardless of whether or not one accepts Joynson and Fletcher's explanation about misplaced data, one must conclude that Burt's deception is inexcusable for a scientist.

Point Three. In a 1978 feature article in *Science*, an American psychologist, Donald Dorfman, attempted to demonstrate statistically the fraudulent nature of data from one of Burt's articles on social mobility and IQ, which showed results consistent with the hypothesis that the average social-class differences in IQ reflect genetic differences. Dorfman argued that the tables in the article fit the normal curve so closely as to be almost certainly faked. In other words, it was improbable that random subject samples would show the high degree of regularity seen in Burt's tables.

Counterpoint. Apparently Dorfman's haste to prove Burt a fraud precluded his reading Burt's article carefully. Burt explicitly indicated that he normalized the data in his tables. Two professors of mathematical statistics, at Harvard and the University of Chicago, refuted Dorfman's effort. They pointed out that Burt's procedure of normalizing the frequencies, or fixing the marginal totals, was a statistically acceptable and not uncommon practice for this type of analysis. Jointly, they further stated that "using Dorfman's inappropriate statistical techniques to detect fraudulent data would be to condemn a major portion, if not all, of empirical science as fabrication."

Point Four. In a claim they later repeated many times in print and on radio, Ann and Alan Clarke wrote to Hearnshaw disclosing that Burt had published articles under their names, based on their doctoral dissertations, and that he distorted their views, in particular "implicitly attacking Eysenck."

Counterpoint. These alleged "articles" turn out to be nothing more than brief abstracts of the Clarkes' Ph.D. dissertations. It was customary for professors to submit their students' dissertation abstracts for publication in the *British Journal of Educational Psychology*. Burt's editing of the abstracts for publication consisted only of stylistic improvements; there is no misrepresentation of their substantive content. The motivation of the Clarkes' prominent role in the Burt affair is still an enigma. It is all the more puzzling since, unlike most of Burt's detractors, they are avowedly not anti-hereditarian and do not appear to be extremists on any of the related scientific issues.

Interestingly, Hearnshaw does not address in detail one of the most serious charges commonly leveled against Burt—that his calculations themselves were fraudulent. My own 1974 examination of Burt's studies did find a number of peculiarities in his data.

Almost all of the errors, however, amounted to the kind of careless copying or proofreading mistakes one could reasonably attribute to Burt's advanced age—he wrote most of the articles in question after the age of seventy-five. Moreover, as Joynson notes in *The Burt Affair*, a number of the apparently erroneous twin and sibling correlations in fact suggest a *decrease* in the heritability coefficient, strengthening the argument for environmental causation of IQ differences. Burt would hardly engage in deliberate fraud in order to bolster a conclusion completely opposite to his own.

Conclusion

What is the moral of this curious story? A talented scientist who works largely alone makes a good many personal enemies. He is sometimes careless and eccentric in his presentation of his studies. He becomes a prominent public figure. Most important, he develops politically incorrect theories on socially sensitive topics. This combination of factors gives his opponents—aided by sympathetic journalists—ample ammunition to attack his reputation.

Such is the essence of the Burt affair. Joynson and Fletcher have disproved some of the accusations and suspicions leveled against Burt, but not all, and not completely. There is room left for doubt. Whether one gives the benefit of the doubt to Burt or to his detractors is still another matter. A convincing defense of Burt is handicapped by his undisputed personal eccentricities and petty foibles, as well as by his failings as an empirical scientist. Since it is next to impossible to prove a negative, no one can confidently proclaim Burt's complete innocence of all charges. He may be guilty of simple carelessness. But the burden of proof rests squarely on those who have proclaimed Burt guilty of fraud. Their evidence has proven so flimsy that I believe an impartial jury would rule out the verdict of fraud, not just on the grounds of "not proven," but simply as not plausible.

A final judgment on Burt would probably not much interest historians of psychology if it had turned out that his conclusions about the heritability of intelligence were wrong. But in the twenty years since Burt died, many scientifically rigorous studies—including a recent MZA-twin replication virtually identical to Burt's—have substantiated the theory that individual differences in intelligence are strongly conditioned by genetic factors. Experts in behavioral genetics now generally agree on this central point. As all the

smoke and fumes of the Burt affair dissipate, this should be cause for optimism: the field of behavioral genetics appears increasingly ready—controversy notwithstanding—to behave as a science like any other.