

Good, Irving John [Jack]

(1916–2009)

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Good, Irving John [Jack] (1916–2009), statistician and applied philosopher, was born Isidore Jacob Gudak at Queen Charlotte's Hospital, Hammersmith, London, on 9 December 1916, the son of Morris Edward Gudak, later Morris Edward Good (1885–1958), a watchmaker, master jeweller, and author (as Moshe Oved), and his wife, Sophia, *née* Polikoff. At the time of his birth registration his parents (who were of Jewish descent, from Russian Poland) lived at 213 Richmond Road, Hackney.

Though slow at reading, Good showed exceptional mathematical promise at an early age. He later recalled that at the age of nine, in bed with diphtheria, he ‘discovered’ the irrationality of the square root of two. He was educated at Haberdashers' Aske's School, Cricklewood, and read mathematics at Jesus College, Cambridge, obtaining a first-class degree in 1938. He then worked for his doctorate with the Russian mathematician A. S. Besicovitch and then with G. H. Hardy. His thesis, completed in 1941, was on notions of fractional dimension. He was awarded a Smith's prize in 1940 and published a number of papers on pure mathematical topics. A keen chess player throughout his life, he was in 1939 Cambridgeshire chess champion.

In 1941 Good was directed to work at Bletchley Park on decoding problems. For many years after the war the existence of Bletchley Park and the work done there were well-guarded secrets; later the story was thoroughly documented, and Good was free to talk about his role. He worked particularly closely with Alan Turing. After the latter's suicide Good, when lecturing, would often, after mentioning Turing, add comments along the lines of, ‘who won the war’.

From 1945 to 1948 Good was a university lecturer in mathematics at Manchester, having been recruited by Max Newman; there he concentrated on developments in computation, and contributed to the design of the Manchester Mark 1, one of the first stored-program computers. He then moved to the Government Communications Headquarters (GCHQ). What that organization did was at the time shrouded in mystery. Nevertheless in the early 1950s Good rather characteristically remarked that had he gone back to being a pure mathematician he might have discovered something so important that bad people would have done harmful things with it, whereas his current work at GCHQ was pointless but harmless. He moved in 1959 from GCHQ to the Admiralty research laboratory, then briefly to the Institute for Defense Analysis in the USA (1962–4), and subsequently to a senior research fellowship at Trinity College, Oxford (1964–7), where the atmosphere did not appeal to him. Many of his main scientific contributions came from this period but his quite exceptionally broad interests and aphoristic style also emerged, for example in talks on the BBC Third Programme, in speculations and constructive suggestions on the future of computation, and in brief written remarks on a wide range of scientific, philosophical, and other issues. Much later he advised Stanley Kubrick in connection with *2001: a Space Odyssey* (1968).

In 1967 Good became a research professor of statistics at Virginia Polytechnic Institute (soon to be renamed Virginia Polytechnic Institute and State University, and better known as Virginia Tech) at Blacksburg, Virginia, USA. The university was one of the land grant colleges founded with a strong interest in agricultural issues. Several had become centres of statistical research and application. Good appears to have had no formal duties but, as from 1969 a distinguished professor, was said to have been for a period one of the two most highly paid academics in the institution. He became an adjunct professor of the Center for the Study of Science in Society from 1983, and an adjunct professor of philosophy from 1984.

Good's broader interests were reflected in his conceiving, editing, and contributing to *The Scientist Speculates: an Anthology of Partly Baked Ideas* (1962). In this he suggested, among other things, that the maximum number of words for a partly baked idea (pbi) of importance *p*, a number less than 1, should be 10 raised to the power $4.5p$, noting that an idea of negative importance would have less than one word. He coined an answer to Goering: 'When I hear the word gun I reach for my culture.' He had discussions with the well-known sage K. Caj Doog (‘Jack Good’ spelled backwards). He suggested storing all major works of art in digitized form, and so on.

Good's single most important publication was his book *Probability and the Weighing of Evidence* (1950), although in some ways *The Estimation of Probabilities* (1965) was an easier introduction. *Good Thinking: the Foundations of Probability and its Applications* (1983) collected many of his less technical contributions; at that stage his list of publications ran to 1517 entries.

The unifying theme to Good's work was his view that 'clear reasoning about many important practical and philosophical questions is impossible except in terms of probability' (I. J. Good, *Good Thinking*, 1983, ix). The development of probability theory from axioms had allowed the theory to develop into a beautiful part of modern mathematics divorced from the question, 'What does probability mean?' But in applications the question cannot be evaded. There are broadly three possible answers. Physical probability aims to capture the properties of physical, biological, or social systems that show regular mass behaviour in the presence of individual haphazardness. Objective degree of belief uses probability to assess the strength of belief of a rational person in an uncertain proposition, given specified information. The third meaning is as a subjective or personalistic degree of belief, constrained by requirements of a certain kind of self-consistency. All have a history. Good developed the subjective view in a nuanced way taking account of the other possible approaches; indeed he emphasized what he called a ‘Bayes/non-Bayes compromise’. The first task was to show that the axioms of the mathematical theory are appropriate, one focus of his first book, but he developed the idea and its implications in many directions, including a very early discussion of a statistical view of causality. He published also powerful and elegant papers on the more specialized aspects of statistical theory, for example on the fast Fourier transform, on smoothing, and, arising from discussion with Turing, on the ‘missing species problem’. The latter was renamed many years later as the question, 'How many words did Shakespeare know and not use?'

The impact of and attitude to Good's work at the time of its publication is difficult to assess. It was certainly widely known, at least within statistical circles in the UK, and regarded as very original and respected as such, but it was too far from the mainstream of the time to be easily absorbed. The main focus of statistical work during the earlier part of his career was on biometrical research, including agriculture, and on the problems of industrial rejuvenation. The personalistic emphasis of Good's work did not fit in well with that. Ten to twenty years later the environment had changed and ideas largely pioneered by Good gained quite wide acceptance. What is striking is the breadth and continuing topicality of much of what he wrote, in a field that developed a bewilderingly extensive literature.

Good's originality and his exceptionally wide-ranging intellectual interests are beyond question. A loner, he appears to have thrived in the highly collegiate if claustrophobic atmosphere at Bletchley Park. The British university world of an earlier period, relatively free as it was from superficial judgements of short-term impact, should have accommodated him, but sadly it did not. He stayed in Blacksburg until his death. There he seems to have found total independence. He took great delight in the numerous awards he received, and equally in those he declined (which he also included in a three-page section on ‘degrees and honors’ in his curriculum vitae). In his last years he was alert mentally but badly handicapped with arthritis. In conversation in Blacksburg a year or so before his death he reminisced with rather touching nostalgia about life in England in the old days. He died on 5 April 2009 in Radford, Virginia. He never married. A memorial service was held at the Blacksburg Jewish Community Center on 19 April.

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