

a final chapter on science and philosophy the author gives his answer to the questions he posed at the outset: "Are there two kinds of problem—the scientific and the philosophic—each of which requires a different method for its solution; or are there two different methods for solving a problem, and according to which we use, we shall get a different answer?" His conclusion that the difference between science and philosophy lies in methodology leads him inescapably to the affirmation that it is the scientific approach rather than the philosophical that has enabled man to make "substantial progress" towards mastering the problems of his material environment. This is an interpretation of history that is sincerely held by many scientists in this country and elsewhere. It is, however, a view that leads the scientist to overvalue his importance to society, for technology, a tradition in human society that is older than science, has arguably had a greater influence in improving man's environment through the ages. In the modern world technology and science march together, since each so obviously depends upon the other.

Sir Harold's view of philosophy, however, is strongly supported by the Nobel laureate James D Watson, who writes in a foreword to the work that "we must not automatically assume that because philosophers' arguments are increasingly subtle, they represent serious advances beyond the commonplace ideas about deduction and induction first formulated . . . by Francis Bacon. I, like Harold Himsworth, am uncomfortable with much of this unneeded complexity." There may well be many, like myself, who would not so peremptorily dismiss the work of modern schools of scientific philosophy.

In contrast to man's scientific achievements, Sir Harold expresses his disappointment at how little man has done to master the problems that he, and by inference society, has created for himself. It is, however, worth reflecting that it is in these very areas of man's social activities that Western philosophy has had, for many of us

who live in Western Europe and the United States, more than a limited amount of success. It has been the concern of Western philosophers with ethics, society, morality, and political thought that has brought about in the Western democracies that very freedom that has been essential to the development of modern science and for the expression of new ideas. This has been particularly true in the United States, where, to paraphrase Tocqueville, the new republic gave people the opportunity of trying to give reality to what European philosophers had dreamed of for centuries.

Sir Harold concludes with a tribute to the Royal Society of London, founded by an enlightened monarch whose tutor in early life, Thomas Hobbes, had known both Galileo and Francis Bacon. It was no accident, he points out, that the founding fathers took for their motto the words "Nullius in verba," implicitly a rejection of scholasticism and authority. The results, he tells us, are there for all to see.

As Robert Glaser records on the book jacket, which also carries tributes from Lord Dainton and Paul Beeson, Sir Harold "uses language beautifully," which would have pleased the philosopher John Locke, whose *Essay Concerning Human Understanding* contains one of the earliest pleas for the accurate use of words and language. Watson, however, refers in his foreword to the "urban civility of Himsworth's thought"; did he not really mean urbane? The book is well produced and a pleasure both to handle and to read. It will undoubtedly stimulate an interest in science and philosophical thought in those who read it, as it did in me, and I have no hesitation in recommending it.

*Scientific Knowledge and Philosophic Thought.* H Himsworth. (Pp 128; £10.20.) Baltimore: The Johns Hopkins University Press, 1986. ISBN 0-8018-3316-7.

## Look before you quote

KAY DICKERSIN, PEG HEWITT

The medical literature has lately reflected increased attention to issues of quality of research. These issues have included study design and operation,<sup>1,2</sup> the correct use of statistical procedures,<sup>3,4</sup> the reporting of study design and results,<sup>5</sup> and peer review.<sup>6</sup> Recent articles have reported the use of inaccurate quotations and references in medical journals<sup>7,8</sup> and discussed the possible consequences. A recent study has suggested that in some cases the problem may be more insidious in that textbooks may systematically misquote previous references; and in the light of this we discuss steps taken by the National Library of Medicine to prevent continued transmission of original errors.

Diane Paul has recently reviewed 28 of the 31 introductory genetics textbooks published from January 1978 to March 1984.<sup>9</sup> She found that of the 19 that included substantial discussions on the heritability of human intelligence most reported that heritability of intelligence quotient (IQ) is high and offered specific estimates of the proportion of IQ that is inherited. In attempting to trace the origin of these statistics, Paul found that the authors of these textbooks often failed to give a source or gave a misleading citation that referred to a secondary source reporting on earlier work. When a study showing evidence for inheritability of intelligence was actually cited by the textbooks it was most often a report written by Erlenmeyer-Kimling and Jarvik in 1963.<sup>10</sup> This article (which might be termed a meta-analysis today) reviewed the results of 52 different kinship studies. As well as having methodological flaws, the review actually identified only four of the supposed 52 studies. One of the

four identified studies was authored by "J Conway," a pseudonym for Sir Cyril Burt, and contained fabricated data. (Sir Cyril Burt's data fabrication was exposed in the late 1970s, yet those in peripherally related fields may not, it seems, be aware of the past scandal and current disregard for his research.)

Thus for a number of good reasons the Erlenmeyer-Kimling and Jarvik paper is considered to be outdated by the scientific community. Yet of the 19 genetics textbooks that discussed the heritability of intelligence 11 cited this review and 10 of these displayed its summary figure. Paul concluded that textbook authors copy from one another, thus propagating invalid hypotheses. Similar examples of propagation of inaccurate or distorted information through textbooks have been described by others.<sup>11,12</sup>

How are these results important to the issue of accurate quotations in the medical literature? Firstly, some textbooks appear not to cite reported work or cite only a secondary source. Secondly, cited articles may be based on falsified data, which may go unrecognised as such by the reviewing authors. The first of these problems was well covered by deLacey *et al.*, and clearly improvement is possible. The second problem, that of authors possibly relying on retracted data, is less easy to solve now, but it will be possible in the future.

In 1983 Altman and Melcher wrote in this journal: "There are no mechanisms built into the scientific process to record data about the frequency of fraud. *Index Medicus* contains no headings listing frauds or correcting false information."<sup>13</sup> In 1984 the National Library of Medicine introduced a medical subject heading (MeSH)

**Articles identified using the MeSH term RETRACTION OF PUBLICATION**

A search of Medline and the Medline backfiles using the MeSH heading RETRACTION OF PUBLICATION identified the following retracted papers:

- Danks DM, Allan J, Phelan PD, Chapman C. Mutations at more than one locus may be involved in cystic fibrosis—evidence based on first-cousin data and direct counting of cases. *Am J Hum Genet* 1983;**35**:838-44.
- Darsee JR, Nutter DO, Hopkins LC, Heymsfield SB. Neurogenic skeletal myopathy in patients with primary cardiomyopathy. *Circulation* 1984;**69**:202.
- Darsee JR, Heymsfield SB. Decreased myocardial taurine levels and hypertaurinuria with mitral-valve prolapse and congestive cardiomyopathy. *N Engl J Med* 1981;**304**:129-35.
- Darsee JR, Kloner RA, Braunwald E. Demonstration of lateral and epicardial border zone salvage by flurbiprofen using an in vitro method for assessing myocardium at risk. *Circulation* 1981;**63**:29-35.
- Darsee JR, Mikolich JR, Walter PF, Schlant RC. Paradoxical rise in left ventricular filling pressure in the dog during positive end-expiratory pressure ventilation. *Circ Res* 1981;**49**:1017-28.
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- Darsee JR, Heymsfield SB, Nutter DO. Hypertrophic cardiomyopathy and human leukocyte antigen linkage: differentiation of two forms of hypertrophic cardiomyopathy. *N Engl J Med* 1979;**300**:877-82.
- Davidson D, Stalcup SA. Systemic circulatory adjustments to acute hypoxia and reoxygenation in unanesthetized sheep. Role of renin, angiotensin II, and catecholamine interactions. *J Clin Invest* 1984;**73**:317-28.
- Davidson D, Stalcup SA, Mellins RB. Angiotensin-converting enzyme and oxygen tension. *Circ Res* 1981;**48**:286-91.
- DeFronzo R, Delbert D, Hendler R, Felig P, Soman V. Insulin sensitivity and insulin binding to monocytes in maturity-onset diabetes. *J Clin Invest* 1979;**63**:939-46.
- DeFronzo RA, Soman V, Sherwin RS, Hendler R, Felig P. Insulin binding to monocytes and insulin action in human obesity, starvation, and refeeding. *J Clin Invest* 1978;**62**:204-13.
- Hays JB, Korba BE. DNA from recombinogenic bacteriophages generated by arl mutant of Escherichia coli is cleaved by single-strand-specific endonuclease SI. *Proc Natl Acad Sci USA* 1979;**76**:6066-70.
- Hosseinzadeh PK, Firkin BG, Pfueller SL. Study of the factors that cause specific transformation in cultures of lymphocytes from patients with quinine- and quinidine-induced immune thrombocytopenia. *J Clin Invest* 1980;**66**:638-45.
- Kark P, Becker D, Perlman S. Reduced enzyme activities in inherited ataxia. *Ann Neurol* 1980;**8**:342.
- Khansari N, Fudenberg NH. Immune elimination of ageing platelets by autologous monocytes: role of membrane-specific antibody. *Eur J Immunol* 1983;**13**:990-4.
- Kloner RA, DeBoer LW, Darsee JR, Ingwall JS, Braunwald E. Correction. Recovery from prolonged abnormalities of canine myocardium salvaged from ischemic necrosis by coronary reperfusion. *Proc Natl Acad Sci USA* 1981;**78**:7152-6.
- Lambert PW, DeOreo PB, Hollis B, Fu IY, Ginsberg DJ, Roos B, Behrman RE. Concurrent measurement of plasma levels of vitamin D3 and five of its metabolites in normal humans, chronic renal failure patients, and anephric subjects. *J Lab Clin Med* 1981;**98**:536-48.
- Muschel RJ, Khoury G, Lebowitz P, Koller R, Dhar R. The human c-ras1H oncogene: a mutation in normal and neoplastic tissue from the same patient. *Science* 1983;**219**:853-6.
- Nathal E, Sierra-Honigmann MR, de la Caba Cortes FJ. Pyrogenic activity in sera of febrile patients mediated by endogenous pyrogen and activators of adenylate cyclase. *Rev Invest Clin* 1984;**36**:125-31.
- O'Brodovich HM, Stalcup SA, Pang LM, Lipset JS, Mellins RB. Bradykinin production and increased pulmonary endothelial permeability during acute respiratory failure in unanesthetized sheep. *J Clin Invest* 1981;**67**:514-22.
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- Slutsky RA. Thallium pulmonary scintigraphy. Relationship to pulmonary fluid volumes during left atrial hypertension and the acute release of pressure. *Invest Radiol* 1984;**19**:510-6.
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- Slutsky RA, Peck WW, Higgins CB, Mancini GB. Pulmonary density distribution in experimental and clinical cardiogenic pulmonary edema evaluated by computed transmission tomography. *Am Heart J* 1984;**108**:401-7.
- Slutsky RA, Watkins J, Costello D. Radionuclide evaluation of the systolic blood pressure/end-systolic volume relationship: response to pharmacologic agents in patients with coronary artery disease. *Am Heart J* 1983;**105**:53-9.
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- Soman VR, DeFronzo RA. Direct evidence for downregulation of insulin receptors by physiologic hyperinsulinemia in man. *Diabetes* 1980;**29**:159-63.
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- Soman VR, Koivisto VA, Grantham P, Felig P. Increased insulin binding to monocytes after acute exercise in normal man. *J Clin Endocrinol Metab* 1978;**47**:216-9.
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- Stalcup SA, Lipset JS, Woan JM, Leuenberger P, Mellins RB. Inhibition of angiotensin converting enzyme activity in cultured endothelial cells by hypoxia. *J Clin Invest* 1979;**63**:966-76.
- Stalcup SA, Pang LM, Lipset JS, O'dya CE, Goodfriend TL, Mellins RB. Angiotensin-converting enzyme and oxygen tension. *Circ Res* 1978;**43**:705-11.
- Teyssot B, Houdebine LM, Djiane J. Prolactin induces release of a factor from membranes capable of stimulating beta-casein gene transcription in isolated mammary cell nuclei. *Proc Natl Acad Sci USA* 1981;**78**:6729-33.

term for published papers that are retracted—RETRACTION OF PUBLICATION.<sup>14</sup> This heading, though introduced in response to issues raised by the Darsee affair, is also used to index articles retracted for reasons other than falsification of data. At present what is indexed under this heading is the letter or notice from the authors, the author's superiors, or the journal editor, not the retracted articles themselves. To modify the retracted article the library adds the text words [Retracted by (author, journal, date)] to the title. This means that retracted articles can easily be identified via Medline, either during the original search or later, before citation.

The National Library of Medicine will soon also incorporate errata notices into the Medline database. The plan is to incorporate the corrections directly into the article, noting on the citation the fact that a change was made. The library estimates that about 300 errata or corrections are published in the medical literature each year.

Although the retraction system does not identify papers retracted before 1984 and the errata corrections policy is not yet finalised, it is reassuring that mechanisms are now being devised to enable investigators to deal with this potential problem when reviewing

published reports, whether for a traditional review or for a meta-analysis.

- 1 Chalmers TC, Smith H, Jr, Blackburn B, *et al*. A method for assessing the quality of a randomized control trial. *Controlled Clin Trials* 1981;2:31-49.
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- 3 Gore SM, Jones IG, Rytter EC. Misuse of statistical methods: critical assessment of articles in BMJ from January to March 1976. *Br Med J* 1977;3:85-7.
- 4 Glantz SA. Biostatistics: how to detect, correct and prevent errors in the medical literature. *Circulation* 1980;61:1-7.
- 5 Meinert CL, Tonascia S, Higgins K. Content of reports on clinical trials: a critical review. *Controlled Clin Trials* 1984;5:328-47.
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- 9 Paul D. Textbook treatments of the genetics of intelligence. *Q Rev Biol* 1985;60:317-26.
- 10 Erlenmeyer-Kimling L, Jarvik LF. Genetics and intelligence: a review. *Science* 1963;142:1477-9.
- 11 Martin L. "Eskimo words for snow": a case study in the genesis and decay of an anthropological example. *American Anthropology* 1986;88:418-23.
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- 14 National Library of Medicine. Retraction of publication. *NLM Technical Bulletin* 1984;July:4.

## Bog bodies

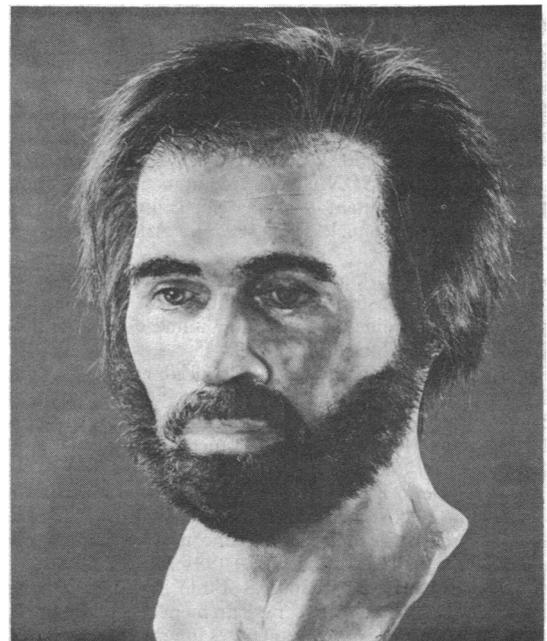
### BERNARD KNIGHT

The story of the Lindow bog body, commonly known as Pete Marsh, who was found in Cheshire's Lindow Moss in 1984 is a melodramatic one. The previous year a female head had been discovered in the same bog and a local man gave himself up to the police, confessing to the murder of his wife in 1960. Though he was convicted, radiocarbon dating showed that his "wife" had died around 210 AD. The same peat worker found Lindow Man, virtually complete apart from the legs, which had been swallowed by the cutting machine. This ancient gentleman is now on display at the British Museum, and that institution has produced two fine volumes as explanatory guides to the remains.

The smaller and cheaper of the two books, *The Bog Man and the Archaeology of People*, is a large format paperback, profusely illustrated, by Don Brothwell, the doyen of scientific archaeology in Britain, who was also one of the editors of *Lindow Man: the Body in the Bog*, the multi-author larger volume. As the title suggests, Brothwell's own book ranges wider than the actual Lindow body, surveying other bog finds and the importance of long preserved cadavers.

Both books describe the exhaustive scientific and medical examinations that followed the discovery of the body and the interpretations of the results. From the medical point of view this is vastly interesting, for few living patients, let alone shrivelled corpses, get as much investigative attention. Pete Marsh was subjected to computed tomography, radiology, serology, electron microscopy, botany, radiometry, entomology, microbiology, parasitology, and several other "ologies." Even dietary and cooking experts were brought in to examine his last meal. Traumatology proved vital, and a forensic pathologist helped to reach the final conclusion that this was yet another Iron Age ritual murder, for Pete Marsh had been strangled with a ligature, hit twice on the head with sufficient force to fracture his skull, and had his neck broken and his throat cut before being pushed face first into the bog.

He shared these doubtful honours with a number of other sacrificial victims who have been found elsewhere, mainly in Denmark, though an extensive catalogue in the larger of the two books names 120 sites in Britain alone where similar suspected victims have been found. No previous bodies have had the extensive and intensive examination afforded Lindow Man though, and the



Lindow man.

information provided by non-invasive computed tomography in particular makes this a unique investigation.

To err is human, and the Lindow story is saved from perfection by a gentlemanly dispute about the date of death—a problem with which forensic pathologists are all too familiar. When the Lindow site and remains were radiocarbon dated a range of 900 years was offered by different laboratories, from 300 BC to AD 550. The discrepancy is still being argued over, as peat from close to the body does not seem contemporaneous with the body itself. The peat seems much older, and the body probably went into the bog during late Romano-Celtic times.

The illustrations in both books are superb, and the smaller book