grandest claims for his subject. (An example: his opening address to the British Region of the Biometric Society, in 1948, began, "The rise of biometry in the 20th century, like that of geometry in the third century before Christ, seems to mark out one of the great ages or critical periods in the advance of the human understanding.") On a more technical level he developed a belated interest in probability, a topic he had scorned in his prime. Fisher now put out a paper (published in five different places) that ignored the extensive modern literature on the theory of probability; it centered on a quasi-classical definition of the concept, and did not even mention the limiting-frequency definition, despite the fact that such a definition is implicit in most of his work and almost explicit in some of his early publications.

I have enjoyed this book. Every page has something of interest, either scientific or social or anecdotal. Many fascinating photographs are included. There is an exhaustive bibliography, compiled some years ago by J. H. Bennett. Two minor items surprised and pleased me. One is a high-level photograph of a huge 5 × 5 Latin Square tree-variety trial laid out under Fisher's instructions in Beddgelert Forest, North Wales, as long ago as 1929. The other item is the identification of the famous but anonymous Lady Tasting Tea--the subject of the second chapter of Fisher's 1935 text, *The Design of Experiments*, which opens, "A lady declares that by tasting a cup of tea made with milk she can discriminate whether the milk or the tea infusion was first added to the cup. We will consider the problem of designing an experiment by means of which this assertion can be tested." This lady, I now learn, was for real; she was Dr. Muriel Bristol, a Rothamsted algologist. And yet I know I have read somewhere that Fisher once told M. G. Kendall that the lady was apocryphal! History is so rife with discrepancies.

## THE LIBRARY OF ISAAC NEWTON. By John Harrison. Cambridge, London, New York, Melbourne (Cambridge University Press), 1978. xiv + 286 pp. $62.50.

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Scholars who do research in the University Library, Cambridge, know John Harrison (Senior Under-Librarian) as a meticulous scholarly bibliographer and a lover of books. Earlier (in collaboration with Peter Laslett), he did another study of a 17th-century library, the one belonging to John Locke. The heart of the present work is an annotated list of 1763 books known to

have been at one time in Newton's personal library. Unlike Locke, Newton was in no sense a book collector. His library, totaling 2100 volumes on his death, was primarily a working library, although a considerable part of the collection was made up of presentation copies of books which their authors wanted to bring to the attention of the great man. For scholars the greatest value of the existence of Newton's library is that many of the books show the obvious signs of wear, attendant on hard use, and that some are annotated. Harrison devotes special care to recording copies of books in Newton's library with annotations or other markings by Newton.

The catalogue is preceded by three very important essays. One is of purely bibliographical interest (on the "Dispersal of Newton's Library after His Death"), but the other two are of major importance to anyone interested in the thought of Isaac Newton. They deal with "Isaac Newton: User of Books" and "The Composition of Newton's Library." The first of this pair is concerned with Newton's purchase of books and his annotations. Beginning in the late 1660s, Newton began to purchase or collect books on alchemy, so many in fact that in Newton's "final" library 169 titles (or "9.5 per cent of a total of 1752 known titles on all subjects") are on alchemy or chemistry. But this high number should not be used as a basis for overaggrandizing the importance of this area of thought as a research interest of Newton's. The fact is that Newton had ready access to Isaac Barrow's library and we know, from the catalogue of Barrow's library, "that he had collected very few books on this subject." Up until Barrow's death in 1677, Newton had no need to buy books of his own in most areas of mathematics, astronomy, and physics, although he did obtain some books in the exact sciences, such as "Gunter's book & sector &c." (No. 728 in Harrison's catalogue) in 1667. In this connection it is important to note that John Wallis, whose work was of real importance to Newton in the formation of his mathematical ideas (second only, perhaps, in importance to that of Descartes) is not represented in Newton's library by any early mathematical writings. (The only works of Wallis in the final Newton library were the *Mechanica*, 1669-1671, No. 1709, and the three-volume *Opera mathematica*, 1693-1699, No. 1710.) But Barrow's library contained nine separate works by Wallis, and other works were available to Newton in the Public Library of the University and the collection of some three or four thousand books in the Trinity College Library.

The books surviving from Newton's library are often of interest because of three reading habits of Newton's. Occasionally, he would write extensive notes on the endpapers. Sometimes he would make marks or comments in the margins of the text. Thus, in his copy of Descartes' *Geometria*, in Latin (1659-1661, No. 507), he has entered "Error" in the margin eight times, "non probo" twice, "Non Geom" [= *Non geometricum est*] three times, and

"Imperf." once. As Harrison remarks (pp. 14-15), "These notes, however, are not an emotional reaction or snap judgement on Newton's part, but rather a series of catchwords for a more developed criticism on intrinsic mathematical grounds which he elaborated in a contemporary piece on 'Errores Cartesij Geometriae.'" Newton had a third way of marking a passage; he would carefully turn back (or fold over) the page of a book so that the upper or lower corner "should pinpoint exactly a previously ordained part of the printed text--a sentence, phrase, or even a single word. If required, both corners of the same page were used."

Harrison has done scholars a real service by listing the exact page or pages of any book in the list that may either bear an annotation or have a "dog-eared" corner. Unfortunately, however, he has not listed pages which show signs of a previous crease, but which have been straightened out. Harrison argues that the pages so restored to their original state are not the result of the actions of some "tidy minded librarian or bookseller" who "might reasonably be presumed to have straightened out ... page corners originally turned back." His argument is based on the fact that "several individual volumes, in addition to having some page corners still bent back, also have others which were certainly once similarly 'dog-eared' and later returned to their original position." Harrison accordingly conjectures that "Newton came back to these pages, did with them whatever he had in mind to do, and then, having finished his business, tidied them up." I find this position very unconvincing. A book-seller or a librarian (or a former owner of a book) who would be so unscholarly as to "tidy up" Newton's pages would very likely do the job haphazardly or carelessly.

Thus, this otherwise admirable guide to Newton's library and his use of books is flawed by the failure to record the pages showing creases that indicate a turned-down corner, now straightened out, and possibly the object of Newton's attention [1]. It is greatly to be hoped that Harrison will prepare a supplement to his catalogue, giving such information--to replace such current entries as No. 507, Descartes' *Geometria* (1659), "a few signs of dog-earing," or No. 571, Leibniz' *Théodicée* (1710), "a few signs of dog-earing." The latter is of particular importance because, as I have shown [2], the *Théodicée* proves to be the source of Newton's knowledge that the term "inertia" was introduced into the language of physical science by Kepler; it was apparently Newton's reading of Leibniz' account of Keplerian inertia that led him to plan to add a note to Def. 3 of the *Principia* explaining the difference between Keplerian inertia and Newtonian inertia. Harrison himself (pp. 25-26) shows the significance of such a folded-over page, subsequently straightened out, in Newton's Latin *Optice* (1706 edition). These examples show why it is important to indicate not only pages presently

folded over, but also those that had once been folded over but are so no longer.

NOTES

1. As Harrison points out, a turned-down corner (whether still turned down or straightened out) is not *necessarily* a proof of Newton's interest, since the page could have been turned down by a later owner or user of the library.

2. See my article, Newton and Keplerian inertia: An echo of Newton's controversy with Leibniz. In *Science, medicine, and society in the Renaissance* (*Festschrift* for Walter Pagel), Allen G. Debus, ed., Vol. 2, pp. 199-211. New York: Science History Publications, 1972.

DIE MATHEMATISCHEN STUDIEN VON G. W. LEIBNIZ ZUR KOMBINATORIK: STUDIA LEIBNITIANA SUPPLEMENTA, Vol. XI. By Eberhard Knobloch. Wiesbaden (Franz Steiner Verlag). 1973. 277 + xvi pp., 2 plates.

DIE MATHEMATISCHEN STUDIEN VON G. W. LEIBNIZ ZUR KOMBINATORIK: TEXTBAND: STUDIA LEIBNITIANA SUPPLEMENTA, Vol. XVI. By Eberhard Knobloch. Wiesbaden (Franz Steiner Verlag). 1976. 339 + xii pp., 2 plates.

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Although Leibniz pursued the study of what is now termed "combinatorics" intermittently from 1666 to 1715, only the *Dissertatio de arte combinatoria* (1666) and a short essay on probability are known to have been published during his lifetime. Furthermore, although he conducted an extensive correspondence with mathematicians throughout Europe, he seems to have met with relatively little response from those with whom he discussed his work in the field of combinatorics. Later in life, he found little time to continue his studies, and, aware of their incompleteness, he hesitated to communicate his findings. Until the present century, comparatively little was known in any detail of the nature of his investigations or the extent of his achievements. Indeed, it is possible that the emphasis placed by Leibniz himself on the *ars combinatoria* as the *ars inveniendi* in association with the *characteristica universalis*