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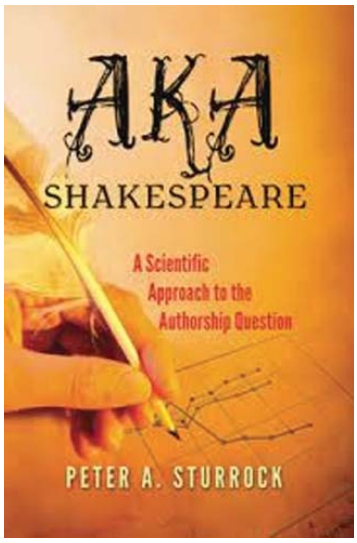
BOOK REVIEW

AKA Shakespeare: A Scientific Approach to the Authorship Question by Peter A. Sturrock. Palo Alto, CA: Exoscience, 2013. 320 pp. $29.95. ISBN 978-0984261451. Color Kindle/Mobi edition US$9.99.

Peter Sturrock's innovative book provides not only an original statistical approach to the Shakespeare authorship question but also an opportunity, by use of an associated website, for the reader to calculate for himself or herself the probability of who the most likely author was.

Peter Sturrock, founder of the Society for Scientific Exploration, President of the Society from 1981 to 2001, and Editor-in-Chief of this Journal in 2008, has had a distinguished career in astrophysics and is Emeritus Professor of Applied Physics and Emeritus Director of the Center for Space Science and Astrophysics at Stanford University. His interest in the authorship question arose a few years ago when he recalled that in his youth he wrote a poem beginning, "Shall I compare thee to a winter's night?" which parodied the sonnet starting with "Shall I compare thee to a summer's day?" He then reread the famous sonnet, the adjacent ones, and then the entire sequence. This led him to wonder who wrote them, to whom they were addressed, and what they were all about. When he assumed the author was William Shakspere of Stratford-upon-Avon, he could find no sensible answers to the other two questions, despite reading books by Shakespeare scholars. He found that many arguments were presented by both the Shakspere-Is-Shakespeare advocates and the Shakspere-Is-Not-Shakespeare dissenters but that no one argument, either way, was conclusive. Eventually he realized that the question could best be resolved by weighing and combining many different pieces of evidence using a process he had thought about for some years and had developed into a method for studying pulsars.

Sturrock discusses how in astrophysics a sharp distinction is required between observation and theory. The task of an observer is to reduce his observations into a summary and the task of a theorist is to compare the summary or "interface" with one or more theories. Using a similar approach for the authorship question, an observer or analyst analyzes the evidence and divides his information into several "items" for which there is a complete list of statements of which only one is correct. For example, the author of the canon of literature was either lame at some time in his life



or he was never lame at any time in his life. The task of the analyst is to assign probabilities to each of the statements on the basis of the data that he has examined. A "theorist" is also introduced for the authorship question who must first decide upon a complete set of hypotheses and then assign probabilities for each of the statements.

The analysis of probability used is a "Bayesian" approach based on an analysis by the Reverend Thomas Bayes (1702–1761), a Presbyterian minister of Tunbridge Wells in Kent, UK, or a theorem by French scientist Pierre-Simon, Marquis de Laplace (1749–1827). With this method the probability we assign to the result of a choice or an event depends on the information we have. We start with a prior probability—our estimate that a certain hypothesis is true prior to obtaining some new information—and after getting the new information, we change to the post probability—our estimate of the probability that the hypothesis is true after obtaining the new information. How much the estimate of probability changes depends on how surprising the new information is. If the new information is not at all surprising, because it is more or less compatible with the hypothesis, it will lead to only a slight change in our opinion of the hypothesis. However, if the new information is surprising, not something we expected on the basis of the hypothesis, then the post probability will be much bigger than the prior probability. Bayes' Theorem has been summarized as "New information increases the probability of a hypothesis in the same proportion as the hypothesis makes the information more likely." A quote from Laplace expresses a similar view: "Probability theory is nothing but common sense reduced to calculation."

A procedure called BASIN, developed first in 1973 for application to astrophysical problems and based on the Theorem, has been used to analyze the hypotheses. An "Interface" is defined between the hypotheses and the data and Bayes Theorem is applied to each side of the interface, allowing the probabilities to be calculated. Degrees of belief (db) are the units used to express confidence in a hypothesis and a chart is given for the corresponding odds, e.g., 10 db is equivalent to a probability of 0.9 and odds of 10, or 10 to 1, that a hypothesis is true; –10 db is equivalent to a probability of 0.1

and odds of 0.1, or 1 in 10, that a hypothesis is true. Similarly, 20 db, 30 db, etc., are equivalent to odds of 100 to 1, 1,000 to 1, etc., supporting the hypothesis, and –20 db, –30 db, etc., are equivalent to odds of 1 in 100, 1 in 1,000, etc., disfavoring the hypothesis. The calculations are performed for the reader by "Prospero" at the website www.aka-shakespeare.com with the password given in the book.

At present more than 60 persons have been suggested as the author of the plays and poems attributed to Shakespeare. Sturrock identifies William Shakspere, a gentleman from Stratford-upon-Avon in Warwickshire, born 1564, and Edward de Vere, the 17th Earl of Oxford, as the main contenders. For clear identification in one word, he calls them "Stratford" and "Oxford," respectively.

David Roper notes that the status of William Shakspere as a gentleman, with the motto "non sans droict" (not without right) in his coat of arms, was most likely bought, and the Garter-King-at-Arms in 1596 and 1599 who approved the grant, Sir William Dethick, was called to account for granting coats to persons without right to the distinction, with the case of John Shakspere expressly charged against him (Roper 2011).

Edward de Vere was born in 1550 in Hedingham Castle, Essex, and grew up there until the age of 12 when his father died. He then became a royal ward of Queen Elizabeth and was placed in the London household of Sir William Cecil, her Secretary of State and chief advisor.

For the initial statistical analysis, Sturrock groups all other candidates together under the name of "Ignotus," about whom nothing is known. If it turned out that the facts ruled out both Stratford and Oxford but not Ignotus (somebody else), another set of options would need to be examined such as "Countess X" and "Sir Francis Y," etc., while still keeping Ignotus as a third candidate.

Noting that the name "Shakespeare" cannot be used for both the author and the gentleman from Stratford-upon-Avon, Sturrock uses a new name for the author, unique in Shakespeare literature, of "Shake*Speare." He observes that although some scholars suggest that a number of the Shakespearian plays had co-authors, no one has suggested that the sonnets had a co-poet. The sonnets were published with the hyphenated name "SHAKE-SPEARE" and Sturrock suggests following this example but using an asterisk rather than a hyphen: "Shake*Speare," as a reminder that the identity of the person is still to be decided.

The three hypotheses examined are:

1. That the author of the plays and poems, "Shake*Speare," was "Stratford," a gentleman from Stratford-upon-Avon in Warwickshire, William Shakspere, who did not try to hide his identity as an author,

and that there was no compact or agreement with others to hide the fact that he was an author;

2. That the author of the plays and poems, Shake*Speare, was "Oxford," Edward de Vere, the 17th Earl of Oxford, and that there was a compact or agreement with others to hide his identity. This hypothesis includes the possibility that Oxford may have been helped by assistants or apprentices;

3. That the author of the plays and poems, Shake*Speare, was "Ignotus," an unknown person, who may have been helped by others, and that there was a compact or agreement with others to hide his identity as an author.

The 25 items related to Shake*Speare that are considered are:

1. Shake*Speare being lame at some time in his life;
2. The occurrence of a compact which resulted in the name of the author being hidden;
3. The existence of records of Stratford's education;
4. The existence of records of Stratford's correspondence;
5. The existence of evidence that Stratford was paid to write;
6. The existence of evidence that Stratford had a patron;
7. The existence of original manuscripts by Stratford;
8. The existence of handwritten inscriptions related to Stratford;
9. The existence of commendatory verses related to Stratford;
10. The existence of records concerning Stratford as a writer;
11. The existence of evidence that Stratford possessed any books;
12. The existence of notices of Stratford's death;
13. The level of education received by Shake*Speare;
14. The extent of travel in Italy by Shake*Speare;
15. The social status of Shake*Speare based on the plays;
16. The quality of Stratford's handwriting;
17. Whether *The Tempest* was based upon an event in Bermuda in 1604;
18. Whether the monument inscription in the Holy Trinity Church at Stratford-upon-Avon identifies Stratford as Shake*Speare;
19. Whether EVERE was secreted in the monument inscription as an encrypted message;
20. Whether the contributors to the First Folio of 1623 believed that Stratford was Shake*Speare;
21. The source of the previously unpublished texts that appeared in the First Folio with the editorial dedication by John Heminge and Henry Condell;
22. Whether Ben Jonson objected, in his dedicatory poem in the First

Folio, to Stratford being buried in Westminster Abbey;
23. The social status of Shake*Speare based on the sonnets;
24. Based on the sonnets, that the poet is named "Will" or uses the name "Will;"
25. That the dedication to the sonnets contains one or more hidden messages.

The material is presented within a series of dialogues between four participants: James, Martin, Beatrice, and Claudia, who meet at a vineyard in the Carmel Valley, California, and other locations. They each have different roles, respectively, of presenting the factual material, helping with the mathematical analysis, and advocating for Stratford or Oxford. Although within the confines of the book one of the advocates necessarily gets the better of each argument, the reader is urged to ignore this and to make up his or her own mind concerning each issue. By entering their own assessments for each of the 25 questions on the website, the weighted rankings of the three candidates will be given. I found the website easy to use and the rankings I received, without mentioning which name, were –287 db (odds disfavoring the hypothesis of 5 10^{28} to 1), 59 db (odds favoring the hypothesis of 7.9 105 to 1), and –59 db (odds disfavoring the hypothesis of 7.9 105 to 1).

The reader does not have to be an expert in any field to follow the debate and weigh the evidence presented to the four characters in the book. Students from any field may find the book a helpful introduction to both the authorship question and to scientific thinking. Devotees of Shakespeare will find it of interest to look at the relevant evidence from a different perspective, and scientists may be intrigued by the application of Bayesian thinking to literature. Although some might feel that the dialogue format adds to the book's length and provides irrelevant information, I found that it introduced a human dimension and made it relatively easy to follow the arguments.

The place of cryptology in answering the authorship question is marked by a great diversity of opinions. Some feel strongly that it has no role, and the very highly respected cryptographers William F. and Elizebeth S. Friedman noted, "We suggest that those who wish to dispute the authorship of the Shakespeare plays should not in future resort to cryptographic evidence, unless they show themselves in some way competent to do so." However, in the book the character Martin notes that according to David Kahn, a distinguished cryptographer, the Friedmans agreed to "accept as valid any cipher that fulfills two conditions: that its plaintext makes sense, and that this plaintext be unique and unambiguous—that, in other words, it not be one of several possible results" (Kahn 1967). In their book, *The Shakespearian Ciphers Examined*, they wrote,

> We shall only ask whether the solutions are valid: that is to say, whether the plain texts make sense, and the cryptosystem and the specific keys can be, or have been, applied without ambiguity. Provided that independent investigation shows an answer to be unique, and to have been reached by valid means, we shall accept it, however much we shock the learned world by doing so. (Friedman & Friedman 1957)

William and Elizebeth Friedman never published work on the monument inscription in the Holy Trinity Church or the dedication to the sonnets. They did not have the opportunity to examine David Roper's seminal 2008 publication *Proving Shakespeare: the Looming Identity Crisis* in which he used Equidistant Letter Sequencing analysis, analogous to the Cardano grille described by the Italian doctor and mathematician Girolamo Cardano in 1550, but it is likely that they would have approved of his method.

By including cryptologic analysis alongside the other strands of evidence in addition to the web analysis (Prospero), Peter Sturrock has provided a comprehensive introduction to the enigma of the great poet and playwright's identity and a scientific method for the reader to calculate for himself or herself the odds for each of three contenders.

I recommend this pioneering book to, among others, those who share with Peter Sturrock a love of poetry and a fondness for attempting to solve problems—be they in mathematics, physics, electrical engineering, astrophysics, or anomalous phenomena—coupled with a conviction that scientific thinking need not be restricted to scientific problems.

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