

DISCUSSION OF: STATISTICAL ANALYSIS OF AN ARCHAEOLOGICAL FIND

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I begin this discussion by quoting a Mosaic law. This is not one that can be found in the Torah, but I know it to be authentic because I heard it from the mouth of Moses himself. The law is, “Statistics is the umpire of the sciences.” This law was told me by Lincoln Moses, one of the top applied statisticians of the twentieth century, a real craftsman with data and a master of the application of statistics and statistical reasoning.

To appreciate this law, one needs to make the distinction between theoretical and applied statistics which I would like to illustrate with an example. A number of years ago, Joe Gani gave a talk to a group of statisticians. During the talk, which included a discussion of Fisher’s work on predicting the number of species of butterflies in Malaysia, he made an aside remark that perhaps the same method could be used to determine the number of words in a person’s vocabulary. The problem, posed in a general mathematical context, resulted in the well-known paper by Efron and Thisted (1976) titled “Estimating the number of unknown species: How many words did Shakespeare know?” And while the authors used the vocabulary framework for the structure of their research, there was no specific application in mind. The intended audience was the statistics community, not a group of Shakespearean scholars. I consider this an example of theoretical statistics.

Later, Thisted happened upon an article reporting that a newly discovered poem could well have been written by Shakespeare. Thisted and Efron (1987) set about modifying their previous results so the assumptions and methodology met the requirements necessary for applying them to the question of whether there was reason to believe that this poem had not been written by Shakespeare. The statistics now served as a tool for the primary purpose, not an end in itself. This is applied statistics. I believe the Mosaic Law, “Statistics is the umpire of the sciences,” is directed toward statisticians working on applied problems. Because the problem which motivated the paper under discussion is an application, it seems appropriate to consider how well the statistics served as umpire in the research.¹

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¹The results of the research were first released by Discovery Channel at a press conference held at the New York City library on February 26th and then to the general public on March 4th, 2007 in the broadcast of their documentary “The Lost Tomb of Jesus,” produced by James Cameron and directed by Simcha Jacobovici.