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Some 19th century arguments for the rational assignment of probabilities for possible events in Nature

Countless decisions are made every day by each of us individually and collectively through our governments and other institutions, about what actions to take in the present in order to optimize a future in which many possible outcomes are more than moderately uncertain. At a personal level, we make these decisions intuitively, based on past experience. At the institutional and government level, we increasingly rely upon quantitative statistical projections and risk assessments. A great deal of interesting and well-worked out mathematics goes into these projections. Most of the mathematics is based upon models in which probabilities can be specified with precision. But the usefulness and reliability of these models depends crucially upon how well the tidy world of the model compares to an incompletely understood nature.

The history of probability and statistics is peppered with arguments, sometimes vociferous, over the assignment of a probability to events in nature, both those that are agreed to be highly probable, such as whether the sun will rise tomorrow, and those that are deemed highly improbable, such as what the chances are of snow in July, or living to the age of 200, or invasion from outer space. In the late 19th century, these arguments were carried on by respectable mathematicians and philosophers who were seeking to find solid ground for inference from incomplete information, the basis of statistics. This talk will explore some of that debate.