

Pascal and the Risk Assessment Code (RAC) Matrix

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Abstract

In 1662, a basic concept for risk assessment was first published: “*Risk should be proportional to both likelihood and consequence.*” This concept underpins the Risk Assessment Code (RAC) that is in use today. The present paper examines the historical precepts more closely and draws conclusions about where we are today, and where we could be.

Introduction - Highlights from History

In recent years, excellent histories have been written about the development of the theories and mathematics supporting risk analyses (refs. 1, 2, 3). This paper only hits a few of the highlights. Figure 1 depicts the major developments in theory and principles associated with the assessment of risk. Two timelines are shown; the upper one spans 8500 years of history up until 1500 AD, and the lower timeline depicts the last 500 years.

Major developments in many numerically intense areas, such as geometry and astronomy, can be traced back more than 6,000 years. In contrast, the major developments in probability theory that underpin risk assessment were not developed until the last 500 years. The reason is simple: the most basic tool to allow that development was not available previously - it is the *Arabic numbering system* that first facilitated computation and communication. Probability theory deals with the number space between zero and one, and Roman numerals - which were the scale of choice in Europe until about 1500 - have no zero. Once the Arabic numbering system took hold and mathematicians began to use it, new theory was postulated and developed at a relatively rapid pace.

It is interesting to note that it took about 500 years for the “new” numbering system to become widely accepted. This time span seems disappointingly long in the context of today's

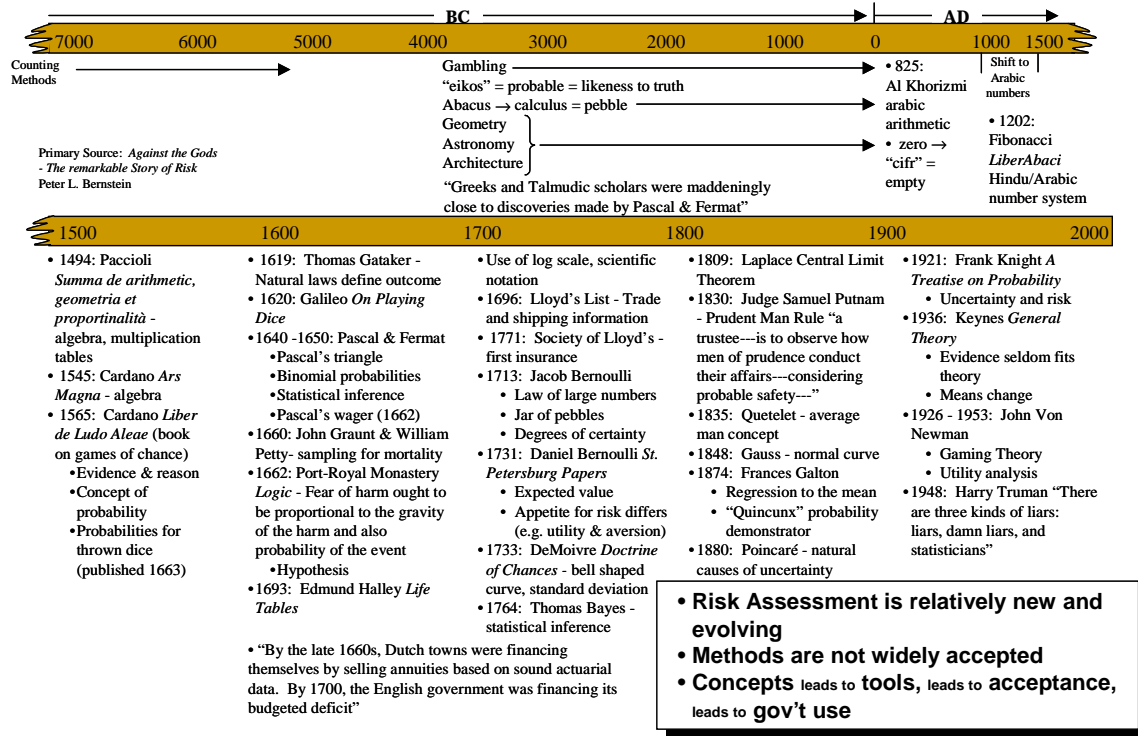


Figure 1 - Quantitative Risk Assessment (QRA) Timeline



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