



*Journ@l Electronique d'Histoire des
Probabilités et de la Statistique*

*Electronic Journ@l for History of
Probability and Statistics*

Vol 7, n°1; Juin/June 2011

www.jehps.net

JURIDICAL PROBABILITY AND JUDICIAL STATISTICS

Thierry MARTIN¹

In the development of probability theory legal concerns long had a prominent role. The emergence of probability was linked to profound changes in the legal field, marked notably by the construction of the doctrine of random contracts [Coumet 1970]. At the end of the 17th century the English writers Craig [1699] and Hooper [1699] initiated the study of the credibility of testimony. From the time of Jacques Bernoulli [1713] and his nephew Nicolas [1709] to that of Condorcet [1785] and Laplace, the relation between probabilistic reasoning and judicial procedures would sustain the development of probability theory. Soon the relationship was enriched by the development of judicial statistics, and here Poisson [1837] and Cournot [1838] harvested the fruits. Despite attacks—Joseph Bertrand, for example, considered the probability of judgments “a series of sterile calculations” [Bertrand 1889]—the application of probability theory to judicial decisions continued to interest mathematicians into the twentieth century, see e.g. Borel [1908, 1909].

In fact, if the probability calculus permits the measurement of the degree of credibility of a judgment it can provide the tools for assessing the probability of testimony. Judicial verdicts coming from juries are expressions of a collective will, and such verdicts were subjected to thorough probabilistic analysis in the 18th century. Following the work of Sandy Zabell [1988], Bernard Bru [1981] or Robert Carvais [2006], we can further study the relations of probability theory to the sphere of law by considering possible exchanges between the two. How much does the theory of probability, in its constitution, owe to its relationship to the law? How, conversely, has the legal system been able to benefit—even indirectly—from studies of the probability of judgments? And, apart from the historical perspective, what relationships can be seen, from an epistemological point of view, between probabilistic reasoning and the pattern of argument in legal proceedings?

¹ Laboratoire *Logiques de l'agir*, Université de Franche-Comté, thierry.martin@univ-fcomte.fr

The mathematical method is actually more often applied to judicial proceedings in the form of statistical analysis. There is a richness here that should be explored in order to clarify the conditions of the method's application, the forms it may take and the difficulties of communicating the results.

These questions provided the themes for an international conference held on 30 September and 1 October 2010, at Besançon, and organized by the laboratory *Logiques de l'agir* in collaboration with the *Centre d'Analyse et de Mathématiques Sociales* (UMR CNRS-EHESS 8557) and with the support of the *Centre Cournot pour la recherche en économie*. The articles published in the present issue come in part from the transactions of this symposium. The texts presented do not pretend to exhaust the issues, or even to map out fully the problems involved in applying the theory of probability and statistical methods to the law; they aim to open up avenues of enquiry and invite further exploration of this vast field of research.

The first group of texts treat what may be called for brevity, juridical probability—the application of probability theory to the field of law. Michel Armatte's investigation is based on making a link between scientific observation and testimony and thus also between the probability of testimony and the theory of errors. At first sight it seems that such a link is so natural that there would have been frequent exchanges between the domains of the probabilistic theory of evidence and the theory of errors. However when Michel Armatte traces the history of the probability of testimony from the late 17th century to the first half of the 19th he shows that things are not so simple, historically, there were two parallel developments. He goes on to describe this “non meeting”.

Angela Palermo examines the work of the jurist and philosopher Francesco Pagano and the place of this little known but crucial author in the formation of the modern legal logic. She considers the complex relationships that were established in the modern period between the logic of the law and the nascent probabilistic logic, relationships forged in the context of a set of transformations of the law which led to a reform of the system of evidence in which Pagano played a leading part. These are the conceptual links between the Leibnizian tradition, the Encyclopaedists and the enlightened Italian reformers Beccaria, Genovesi, Pagano, etc..

The contribution by Thierry Martin is somewhat experimental for it aims to test the hypothesis that the mathematician Nicolas-François Canard, generally considered a forerunner of mathematical economics, would have developed a probabilistic argument to support the reform of criminal procedure at the dawn of the 19th century. The conclusion is negative: Canard developed a theory of the probability of judgments and of moral certainty but it had very little to do with mathematical probability theory.

Olivier Daudé sets out to consider the probability of testimony as it is treated in the philosophy of Charles Peirce: the study involves an examination of the status of miracles and of the historical method from the point of view of pragmatism. The analysis leads on to a re-examination of the definition and scope of logic.

The article by Bernardo Bolaños is of a quite different kind. It focuses on the legal epistemology of Condorcet, comparing it with different forms of normative ethics. Again legal logic and probabilistic logic are considered together but this time with reference to contemporary thought and the recent development of social choice theory.

The three contributions that follow consider applications of statistics to legal practice. Fanny Billod examines the work of Ignatz of Luca, which inaugurated the university study of statistics in Austria at the end of the 18th century, succeeding the German descriptive statistics of Achenwall, but not departing from its literary orientation or the role it played in building a centralized state. She shows how statistics, law and political science combined to train the future civil servants of the Habsburg monarchy.

The article by Évelyne Serverin considers the arguments for divorce reform in France both today and in the 19th century and investigates the way statistics have been mobilized to serve different normative models. She distinguishes four ways of thinking about the effects of the law, a model that may be described as pragmatic, a utilitarian model (represented notably by Jacques Bertillon), a moral model and finally the administrative model behind contemporary divorce reform. These models reflect different choices in public policy.

Finally Renée Zauberman and Philippe Robert show how the measurement of crime in Europe has evolved over the past two centuries: the collection of crime statistics was first institutionalized in the nineteenth century with an important landmark the publication of the *Compte général de l'administration de la justice criminelle* from 1827. Two significant points emerge from this account: there was a gradual shift in responsibility for the measurement of crime from the justice ministry to the police and secondly there was a change in methodology exemplified by the use of victim surveys.

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