

Twenty Years After: Ian Hacking's *The Taming of Chance*

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Chance in the ancient world

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I am undecided whether the affairs of human beings evolve by fate, and an immutable inevitability, or by chance (Tacitus, 6.22)

Absence of a probability calculus

Use of randomization widespread, ...

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- ▶ games of chance

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Many theories have been advanced

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- ▶ Parmenides and the creation of the Universe
- ▶ Argument reappears in Leibniz (and others)

A Brief History of (Mathematical) Chance

- ▶ 1654: Fermat-Pascal correspondence

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- ▶ 1933: Kolmogorov's *Grundbegriffe der Wahrscheinlichkeitsrechnung*

⋮

The 20th century probabilistic revolution

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and exact, – a work of true learning, beyond criticism”.*
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Subtitle: *From the time of Pascal to that of Laplace.*

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 - ▶ *Answer*: the new concept both aleatory and epistemic

Explosion of interest in history of probability and statistics

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and many (many) more since then ...

Intermezzo: Laplacean determinism

We ought to regard the present state of the universe as the effect of its prior state and the cause of the one to follow. An intelligence that, at a given instant, knew all the forces acting in nature and the positions of all things in the universe, could comprehend in one single formula the motions of the largest bodies as well as the lightest atoms in the world, provided that its intellect were sufficiently powerful to subject these data to analysis. For such an intelligence nothing would be uncertain, and the future, like the past, would be open to its eyes.

Laplace's view of probability

The curve described by a molecule of air or of vapour is following a rule as certainly as the orbits of the planets: the only difference between the two is due to our ignorance. Probability is related, in part to this ignorance, in part to our knowledge.

Laplace, *Essai philosophique sur les probabilités*

The Taming of Chance

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Case studies (one per chapter) are used to argue this.

The argument in detail

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 - ▶ differing norms
 - ▶ views of the individual vs. society.

The result of the probabilistic revolution

A quadruple success story for probability:

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Probability the success story of first half of 20th century.

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- ▶ Richard Leslie Ellis (England, 1844)

Contemporary evidence: Cournot

1843: *Exposition de la théorie des chances et des probabilités*

One will pardon me for transcribing here, not so much in order to conserve my rights to the priority of certain ideas, than as a testimony of a friendship of which the memory to me will always be precious, and also as an account of some opinions of a celebrated man, relevant to the subject with which we are occupied, the letter which M. Poisson wrote to me, in response to another in which I had submitted to him the summary of the book which I publish at this moment:

Poisson's letter (one year before 1837!)

Paris, 26 January 1836

.

Monsieur,

.

It will be with great pleasure that I will read the work which you propose to publish on the doctrine of chances. That which I have actually completed will not be an obstacle, and I will willingly yield the center-stage to a more complete book. I place between the words chance and probability the same difference as you, and I very much insisted on this difference.

.

Poisson

Indeterminism gained?

Hacking's claim has been disputed (are his examples special?)

See Hacking (1990) for the view that determinism was already seriously eroded in the nineteenth century, long before the emergence of quantum mechanics. Although this might have been true for Peirce ... I've found little support for the view that scientists at large believed in anything but an ultimate determinism of all physical phenomena until well after the discovery of radioactive decay. (van Brakel, HSPS, 1991)

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Thus in the tradition Hacking identifies but in wrong direction

The renunciation of determinism

BdF: *In any case, for what concerns us as human beings, interested in foreseeing the future with some degree of confidence on the basis of our scanty, imprecise and uncertain knowledge of the present and the past, all arguments about determinism are purely academic In the final analysis, it seems to be of very little consequence or assistance to us if we take up a position for or against the plausibility of the hypothesis that Laplace's superman could work out the entire future **if only he knew the entire present in every detail.***

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- ▶ statistics: I. J. Good, L. J. Savage