

SCIENCE

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FRIDAY, DECEMBER 20, 1895.

THE LAW OF THE LONG RUN.

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"MEN were surprised to hear that not only births, deaths and marriages, but the decisions of tribunals, the results of popular elections, the influence of punishments in checking crime, the comparative values of medical remedies, the probable limits of error in numerical results in every department of physical inquiry, the detection of causes, physical, social and moral, nay even the weight of evidence and the validity of logical argument, might come to be surveyed with the lynx-eyed scrutiny of a dispassionate analysis."

So wrote Sir John Herschel, a good many years ago, of the *Calculus of Probabilities*, which had just come into prominence through important practical applications. The 'Doctrine of Chance' is apparently miscalled because it is chiefly applied to the study and development of natural laws in the operation of which there can be no such thing as chance.

Popularly the word 'chance' is often used as if to imply the *absence* of any cause, but this is an unreasonable, if not an unthinkable condition. Really such words as 'chance,' 'accident' and the like imply only the absence of any assigned or recognized cause, and the doctrine of chances is a study and development of the laws relating to a series or aggregation of events, concerning the individual components of which we are absolutely ignorant. Thus, if

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