THE PASSION FOR THE DICE: THE OTHER SIDE OF STATISTICS.

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Throughout the ages Man has deified chance, making it the language of the gods. The Other of the Symbolic could be consulted through it, as can be seen by those objects, those various sorts of dice for generating chance, dating from prehistoric times. The future could also be questioned through the random distribution of objects in nature: in antiquity the veins of leaves or the arrangement of organs inside a chicken could, for example, help warlords make decisions by indicating the propitious moment to engage in battle.

In the Middle Ages, chance became legislated: resorting to the drawing of lots for consultative or divinatory purposes, or to decide who a given thing should fall to, was prohibited by theology (with the exception of Thomist theology). In other words, recourse to the drawing of lots had to be codified and regulated. At that time the word 'probability' designated the degree to which an opinion conformed to authority: whether or not it was probable, for example, that a thought could be attributed to Aristotle or to a father of the Church. But from the 17th century onwards probability referred to a degree of certainty no longer based on authority but on the evidence of things and the reliability of testimonies. A notion of chance ('*hasard*' in French stemming from the Arabic 'azzar' meaning game of dice), begins to emerge here insofar as it operates in games of chance and in real life events and can be quantified by a 'more or less probable'. So, a vast domain of vocabulary gradually entered into mathematical relations:[1] opinion, expectation, luck, average, contingency, coincidence, facility, possibility, accident, risk, proclivity, propensity, fortuitous, aleatory, verisimilitude, frequency, credibility, (un)predictability, almost, perhaps, etc.

The turning point came when Pascal took God himself as the object of a wager, the object of a mastered chance. Thus chance could enter mathematics, since it was no longer considered as the sign of divine will. As traditionally told, the calculus of probabilities was born when Pascal answered the Chevalier de Méré in relation to the problem of how to share out stakes: what is the fair way to share out the stakes of a game when it has been interrupted? At the origin of probabilities there was still this question of fairness and justice as well as of knowledge. The philosophers of the Enlightenment had been haunted by the problem of the genesis of convictions which focused on the question of induction where no rational deductions could be called upon as a demonstration. Could we have rules of understanding based on probabilities? This is something that has been continuously asserted by users of probability and statistics for the last three centuries.[2]

In fact, probability is introduced to help us reach a decision when our knowledge is gaping. It takes it upon itself to tame chance by defining it. Chance as we understand it today only exists through a mathematical definition of the laws of chance. What other means could there be of knowing whether a coin is truly symmetrical, and, therefore, a creator of chance, other than by tossing it long enough to check that it follows the laws of chance (Bernouilli's law of large numbers, 1713)? When the number of throws increases, does the relation between the number of "tails" and the total number of throws tend towards 1/2 as expected?

But chance can also arise outside the symbolic chain as an event considered on the side of the real. Such an encounter, unexpected at an individual level, a suicide for instance, is nevertheless the starting point for a statistical perspective that reintroduces a regularity where it seemed absolutely proscribed (the regularity of suicide rates year on year, for instance).[3] In another respect a new object appears: the average or even the average man (Quételet, 1835),[4] which is founded on a Gaussian distribution (1810) of data taken from a large population.

There are thus two mathematical tools that have been forged to control chance. On the one hand, there are probabilities which give an *a priori* value of verisimilitude to help a decision making process on the model of a lottery drum containing six white balls and four black ones: it is *a priori* more "reasonable" to bet that you will pick a white ball (probability of 3/5 against 2/5 for a black ball). On the other hand, there are statistics that cipher the frequency of appearance of aleatory phenomena descriptively. Historically they cut across and complete each other, and are in tension. The first one has been called the subjective approach, invented to mitigate our ignorance and help decisions; the second has been called objective, extracted from the facts themselves. Statistical regularities were exploited by the English statistician Bayes (1702-1761) who inferred, from this *a posteriori* regularity, the existence of a hidden and thereby revealed *a priori* probability, which retrospectively explains the observed reality according to the law of large numbers. This is the "reverse" problem explored by Bernouilli, which went from the known probability to the law of odds.

A lottery drum containing a big, but unknown number of balls of two different colours gives a very simplified idea of such a situation: if the balls are replaced each time, the aleatory draw will approach the unknown distribution between the two colours more closely, if they are repeated many times, and, therefore, give an approximate value of the *a priori* supposed probability. The usual formalisation of this problem is more complex: as the model followed is based on several lottery drums, composed probabilities have to intervene. Such a model led to the formula of "Bayes' theorem" concerning conditional probabilities. This theory, proposed by Bayes, which induces probability causes to observed facts, raises philosophical and theological problems when applied to humans: how do human facts, physical or moral, obey an *a priori* probabilistic regularity without being dependent on a divine intervention? How can one not question this statistical fatalism which undermines the freedom of everyone? The theory is also criticised for its way of using *a priori* probabilities, even before any partial knowledge is gained, by the "frequentists" who cannot admit this. On this point a dividing line gets drawn between the "subjectivists" and "frequentists", or, using scholastic terms, an opposition is made between "nominalists" and "realists".

The success of statistics and their spread throughout the 19th and 20th centuries have laid the foundations for a notion of the State through census and the division of the population into aggregates designated according to classes of equivalence, divisions aiming at establishing a new common sense and a new administration of individuals: today, for instance, the elderly, adolescence, deprived areas, mental health, etc. One has to grasp how much modern states would not exist without statistics – in fact, both terms have a common etymology. The question, which is both political and epistemological, of the realism of such designated aggregates and of the realism of the causes is recurrent amongst statisticians and leads to what Alain Desrosières called a "statistical rhetoric": the "double growth of techniques for the recording and shaping of a whole array of new objects has the effect of considerably broadening the space of reality of the statistical universe and pushes back the frontier zone along which statistical rhetoric finds itself confronting other forms of rhetoric."[5] This expression is particularly striking if one opposes rhetoric and mathematics, as Jacques-Alain Miller has proposed,[6] and if we do not simply consider their conjunction an oxymoron: would statistics be more on the side of rhetoric than on the side of mathematics proper? [7] Dissension amongst statisticians about internal questions of interpretation of their objects and their results (which would be unimaginable among mathematicians) leads us to think that this is indeed the case.

"The game is the subject" wrote Lacan.[8] The passion of the player which served as a prelude to the origin of probabilities is there as the other side of statistics – a passion with the double meaning of suffering and being totally committed.

Translated by Vincent Dachy

1. See I. Hacking, *The emergence of probability*, Cambridge University Press, 1975.
2. The summary presented in these paragraphs owes much to the work of Alain Derosières, *La politique des grands nombres. Histoire de la raison statistique*, Paris, La Découverte, 1993. The remarks that I have drawn are of course mine.
3. So Émile Durkheim talked of "collective tendency" to suicide. See É. Durkheim, *le Suicide*, Paris, PUF, 1967, p. 16.
4. See A. Quételet, *Sur l'homme et le développement de ses facultés ou essais de physique sociale*, Paris, Fayard, 1991.
5. A. Desrosières, *op.cit.*, p. 131.
6. J.-A. Miller, 'Un rêve de Lacan', in *Le réel en mathématiques*. *Psychanalyse et mathématiques,* Edited by C. Cartier and N. Charraud, Paris, Agalma, Seuil, 2004, pp. 113-114 among others.
7. Probabilities entered in axiomatised mathematic according to the wish of Hilbert with "Foundations of the calculus of probabilities" by

Kolmogorov (1930). See. M. Petit, *L'Équation de Kolmogoroff*, Paris, Ramsay. 2003. They lost all meanings and significations which on the contrary follow hot on the heels of the statistical universe.

8. J. Lacan, *Autres Écrits*, Paris, Seuil, 2001, P.164.