

The Misery and Splendours of Sociophysics.

Par Pablo Jensen. Le 3 March 2014

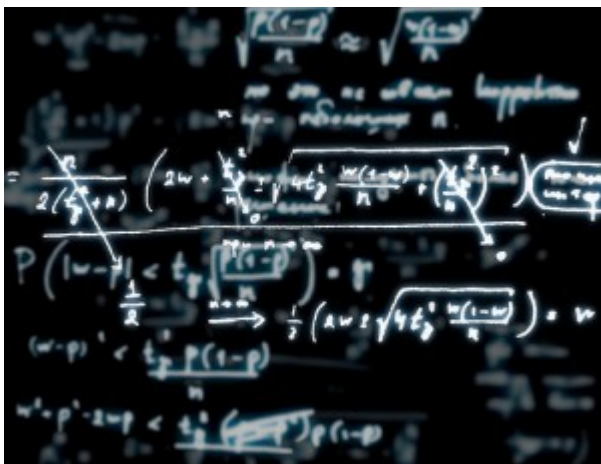


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Physicists can be annoying when they attack social systems. For example, when one of them learnedly explains in *Le Monde* the very close result of several elections from the early 2000s using elegant mathematical models... which are completely unrealistic. Or again when one of the most visible “socio-physicists” affirmed in 2007 in the prestigious English review *Nature* that, “our knowledge of mechanisms governing [social] dynamics is still limited,” but that it is, “essential for the self-optimization [sic] of society as a whole”. It seems that physicists live in a space-time of their own... Must they be sent back to their particles and asked to no longer busy themselves with “social atoms” ?

History being a better counsellor than anger, let us go back two centuries. At the beginning of the 19th century, the elite among mathematicians and physicists (Laplace, Fourier, Poisson...) was developing formal tools capable of digesting the “avalanche of printed numbers”, as Ian Hacking put it, on populations. This work gave birth to a whole new science : statistics. However, the history of the science teaches us that scientific innovations often follow unpredictable, and even improbable paths. Thus in the 1830s, the Belgian astronomer Adophe Quételet visited the prestigious Paris observatory directed by Laplace. He learned about a lot of social data and tried to apply all sorts of equations to them, being careful not to pollute his equations by any suggestion about the possible meaning of the coefficients... He also had access to national data on suicides

and was surprised by the relative constancy, from year to year, of the total number of these acts, so unpredictable at the individual level. He audaciously extrapolated these regularities while affirming that individual unpredictabilities are always offset when a great number of individuals are aggregated : “What relates to the human species, as considered all together, is of the order of physical facts”. Quételet wanted to create a “social mechanics” as rigorous as Laplace’s “Celestial Mechanics”, and capable of governing human masses. Whatever may be thought of the empirical justifications of this extrapolation, history teaches that Durkheim was inspired by Quételet, thus contributing to the birth of the science of society, sociology.

What lessons can be learned from this story ? First of all, that more or less savage exchanges have always taken place between domains. These exchanges were not only one-way since statistical physics was born during this time thanks to the idea that attention must be paid to averages and not only to individuals (i.e. atoms). The next lesson is that work which is a little crazy can, in the long term, lead to interesting results. More broadly, it is tempting to draw a parallel between the two eras. For if physicists are interested today in social systems, it is in large part because we are witnessing a similar “avalanche of numerical data”. At the time, the avalanche of data was linked to the rise in power of European States, which became powerful organisations, capable of controlling “their” populations at a scale never before seen. They measured the strength and health of soldiers, the crime rates to rationalise justice, the sicknesses to regulate insurance and encourage public health... And this movement would change the life of populations, which became knowable by the centre. Statistics could help the centre capable of commanding (and taxing !) only after the standardisation of a territory : cadaster, family names... Today there is no need to stress the scale of the upheavals caused by the digital revolution, as much in economics (Google as a major actor, difficulties for cultural industries...) than in politics (the role of social networks in citizen coordination, Open data administration...), or at the academic level (scientific journals, hierarchisation of knowledge...).

If the scientific community wishes to remain relevant on these questions, it must create new disciplines. For the avalanche of data on society can be the source of a renewal for the Social Sciences and Humanities as long as fruitful collaboration can be cultivated with researchers from the formal sciences, such as mathematics, computer science, and physics, capable of developing the equivalent of the statistics of old, that is, new data-analysis tools to digest this tsunami of data. This collaboration depends on a certain tolerance towards contemporary Quételets, all the while encouraging truly interdisciplinary collaborations, which is the only way of ensuring the relevance of the questions addressed as well as the formal tools developed. On the political level, it is important not to leave the ideological terrain to the sole possession of Google “evangelists”, by encouraging an educated reflection on the social effects of the digital revolution, and by giving citizens the means to better control its effects.

Translation : Annette Stomp.

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