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lecture 3 of 14: risk and social physics

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student observations

“resistance”

- “resistance encountered by early statisticians”
- “resistance to statistics”
- “resistance to change. He [GG] shared that for many who “practiced” risk were hesitant to accept a mathematical theory of risk because it would require a new understanding of the world"
- “resistance to adopting mathematical theories of risk in eighteenth-century England. According to the Kuhnian paradigm,”
- “Quetelet’s resistance from the “philosophers and priests,” whom he accused of being “fatalists”"
- “the 18th c. industries were reluctant to adopt new methods.”

On Q and crime:

- “Porter’s mention of Quetelet’s advocacy for "laws exercising a perfect rule over apparent disorder" was especially concerning. This seems to be an example of exactly what Wallach warned - (inadvertent) discrimination against minorities by over focusing on the majority.”
- “Porter discusses Quetelet’s goal of improving society and government through studying science and statistics;”

Connections (and concerns):

- "[Q's] belief in the regularity of humankind [reminded me of] Tufekci's discussion of the political implications of massive data collection in the twenty-first century. Although both scholars' ideas exist in two starkly different time periods, they reflect how the aggregation of information increases the power and reach of politics."
- "Porter's mention of Quetelet's advocacy for "laws exercising a perfect rule over apparent disorder" [reminded me of] what Wallach warned - (inadvertent) discrimination against minorities by over focusing on the majority."

guiding questions every week

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- Scientific and mathematical development
- Technologies and engineering
- Driving forces: money, prestige, resources, Imperial competition
- how did new capabilities rearrange power? (who can now do what, from what, to whom?)

themes

themes

- non obviousness and resistance to statistical analysis of human phenomena
- Quetelet creation of society and social physics
  - science aspirations
  - claims of objectivity about human beings
- policy: from descriptive to prescriptive
- focus on averages *rather* variation à la Galton next time

readings: Gigerenzer, Quetelet, Porter

1) Pre-statistical background: Gigerenzer, et al.

The Empire of Chance: How Probability Changed Science and Everyday Life. Ideas in Context. Cambridge: Cambridge University Press, 1989, Section 1.6 ("Risk and Insurance")

resistance

resistance

- Why resistance to probability among practitioners of risk: science of risk "positively anti-statistical"

  "Writers on annuities gave analogous advice. The practice of risk was not simply astatistical; it was positively antistatistical in its focus on the individual case to the neglect of large numbers and the long term."

Whose knowledge matters

- Whose knowledge significant in this case?
- How do they gain expertise?
- What sort of knowledge needed for, say insurance?
- Who is best placed to make descriptive and prescriptive judgments?

What needs to change in conception

- What is new conception of world and of people required?
- How do numbers apply to contingency in the world?
- Are human “countable” in any meaningful way

Prescriptive

- What do we prescribe–what do we do as a matter of policy–on the basis of understandings of risk?

guiding question what do you need for a statistical world-view?

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- next few weeks seeing
  - change in practitioners
  - change in sources of knowledge
  - political and social power of statistical inquiry

2) Adolphe Quetelet

"Preface" and "Introductory," *A Treatise on Man* (1842)

- What is this new science of man?
  - What qualities should have it have?
  - Who produces this knowledge
  - How different from earlier "sciences" of "man"?

Let's talk through a few stages of *On Man*.

Experience

Experience alone can with certainty solve a problem which no a priori reasoning could determine. It is of primary importance to keep out of view man as he exists as an insulated, separate, or in an individual state, and to regard him only as a fraction of the species. In thus setting aside his individual nature, we get quit of all which is accidental, and the individual peculiarities, which exercise scarcely any influence over the mass, become effaced of their own accord, allowing the observer to seize the general results. [5]

Regularity

This remarkable constancy with which the same crimes appear annually in the same order, drawing down on their perpetrators the same punishments, in the same proportions, is a singular fact, which we owe to the statistics of the tribunals. In various writings, I have done my utmost to put this evidence clearly before the public; I have never failed annually to repeat, that there is a budget which we pay with frightful regularity—it is that of prisons, dungeons, and scaffolds. [6]

“society”

Society includes within itself the germs of all the crimes committed, and at the same time the necessary facilities. It is the social state, in some measure, which prepares these crime, and the criminal is merely the instrument to execute them. Every social state supposes, then, a certain number and a certain order of crimes, these being the merely the necessary consequences of its organization. [6]

Moral phenomena resemble physical phenomena

It would appear, then, that moral phenomena, when observed on a great scale, are found to resemble physical phenomena; and we thus arrive in inquires of this kind, at the fundamental principle: that the great the number of individuals observed, the more do individual particularities, whether physical or moral, become effaced, and leave in a prominent point of view the general facts, by virtue of which society exists and is preserved. [6]

fundamental focus: “average man”

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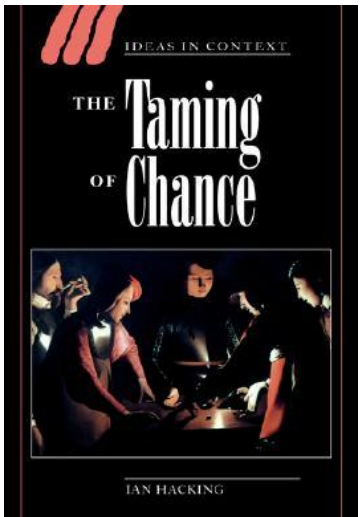
- averages *characterize* the normal types of a given society or race

  "A race would be characterized by its measurements of physical and moral qualities, summed up in the average man of that race." (Ian Hacking, 107)

- comparative: differences between "races," between men and women
- developmental: differences of human being over time
- developmental: differences of individual human being



technologies of dealing with data

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- major conceptual leap in moving from astronomy to society

astronomy

- issue: variation among observations taken by various people at different times with different equipment
- how find true value of the star's position given variation in *observations*
- great mathematicians (Legendre, Gauss, Laplace) show how to use least squares to reduce data and discern "true" position of the star

Quetelet applies to human beings

- transfer idea of discerning average amid variation to measurements of *many human beings*

instead of asking:

- how find true value of the star's position given variation in *observations*

We now ask:

- how find true "average" given varition among members of a *population*

Quetelet's crazy jump was to treat averages *about human beings* as if they were real quantities out there that we were discovering, as if the average height of a population was a real thing, just like the position of a star, to describe the population "objectively."

Example: measuring solidiers

- measurement of chests of Scottish soldiers
- LAB on Thursday!

movement from PHYSICAL to MORAL characteristics

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- stability of marriages, crimes, etc.
- display very similar regularities to those of height, weight, etc.

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3) Porter, Theodore.

The Rise of Statistical Thinking, 1820-1900 (Princeton, N.J.: Princeton University Press, 1986), chap. 2 (40-70) + 100-109.

- Porter is a *secondary sources*: what questions should we ask in reading one?
- lots of context around Quetelet's role in shaping our thinking about data, people, and policy.
- Generally, how does P interpret and explain what Q is up to?
- Anything you found wanting in P's interpretation?

Connection with science

Connection with science

Portlock of statistical society of Ulster

> *believed that statustucs represented the empirical stage of a social science. . . [like] "astronomy, zoology, botany, chemistry, and geology."*

LIBERAL POLITICS

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- How does Porter understand Quetelet's *political* project.
- 46: "If social physics is to be conceived in part as a testament to the confidence and ambition of the astronomer, it must also be recognized as a paean to social order in the spirit of gradualist liberalism".
- 56: "Secular social evolution" rather than what sort of political change?

DEVIANCE and HUMAN MEAN

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"The implication of Quetelet's idealizations of the mean was that all deviation from it should be regarded as flawed, the product of error. This did not imply, however, that variation must stand outside the domain of science, for the special task of probability theory was"to establish an admirable precision where one believed there were only games of chance." (Porter, 104)

CHARACTERIZING PEOPLE AND RACES: LOOKING AHEAD

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- Average man as "type" of nation [Porter 52]

  The perfectibility of the human species is derived as a necessary consequence of all our investigations. Defects and monstrosities disappear more and more from the body; the frequency and the gravity of maladies are combatted with greater effectiveness through the progress of medical science; the moral qualities of man will meet with improvements no less tangible; and the more we advance, the less need we fear the effects and the consequences of great political upheavals and wars, the plagues of humanity. [On man]

pointing towards eugenics

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Two parts of eugenics

- characterizing humans with new "objective" measurements
- social policies to alter "average qualities of race"

"In short, the average man led to both a new kind of information about population and a new conception of how to control them." (Hacking 108)

NEXT WEEK: GALTON AND EUGENICS

WHAT SCIENCE MAKE POSSIBLE and THINKABLE

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- Social MODEL for new forms of science of mass phenomena
- important source of analogies for other scientific fields Quetelet showed how 'statistical laws can prevail for a mass even when the constituent individuals are too numerous or too inscrutable for their actions to be under-stood in any detail." (55)
- new sense of what means to accept *uncertainty* around invidividuals while having knowledge of whole

  The evident success of statistics as an approach to social science was not interpreted by contemporaries as vindication of a metaphysic which regarded the laws governing certain domains as only probable. On the contrary, statistical laws were deliberately formulated to extend the certainty of sciences like astronomy and mechanics to knowledge of phenomena which hitherto had resisted exact scientific investigation. (69; our emphasis)

power and principles

how did new capabilities rearrange power? who can now do what, from what, to whom?

role of rights, harms, justice?

foreshadowing data for Thursday

reminder of themes/big main takeaways

themes

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up next

appendix

appendix

- 2020-01-21 : 1 of 14 intro to course
- 2020-01-28 : 2 of 14 setting the stakes
- 2020-02-04 : 3 of 14 risk and social physics
- 2020-02-11 : 4 of 14 statecraft and quantitative racism
- 2020-02-18 : 5 of 14 intelligence, causality, and policy
- 2020-02-25 : 6 of 14 data gets real: mathematical baptism
- 2020-03-03 : 7 of 14 WWII, dawn of digital computation
- 2020-03-10 : 8 of 14 birth and death of AI
- 2020-03-24 : 9 of 14 big data, old school (1958-1980)
- 2020-03-31 : 10 of 14 data science, 1962-2017
- 2020-04-07 : 11 of 14 AI2.0
- 2020-04-14 : 12 of 14 ethics
- 2020-04-21 : 13 of 14 present problems: attention economy+VC=dumpsterfire
- 2020-04-28 : 14 of 14 future solutions