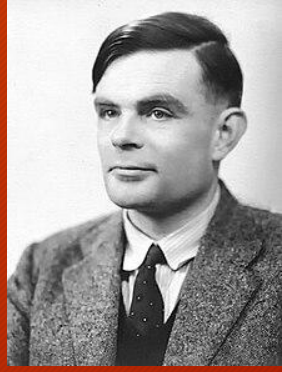


A half-life in industry

How one person who didn’t really know what they were doing (at the beginning at least) navigated a career

Overview

- Things I read, and people said, that stuck
- How do I decide between academia and industry, or half-&-half?
- How has work as a statistician in industry changed over the past 40 years?
- What were my personal highs and lows?
- What did I learn about myself that I'd wished I'd known at the start?

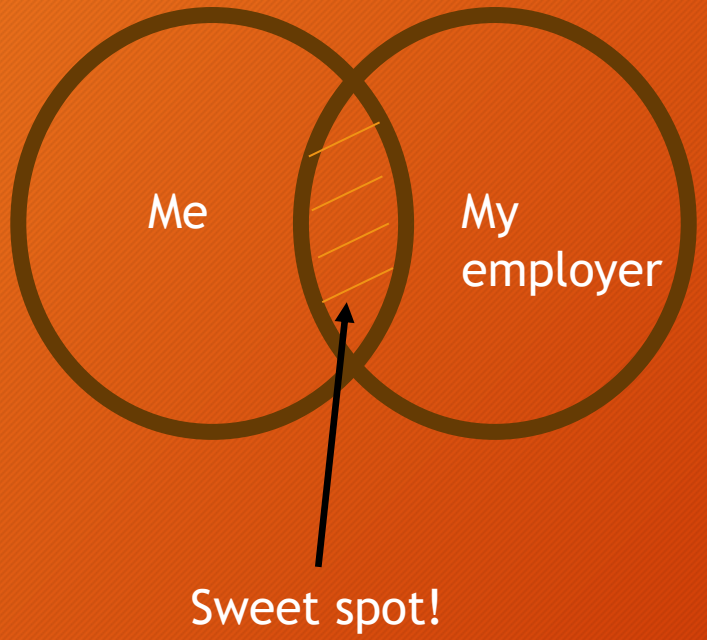
… and guess the statistician (and occasional mathematician and physicist)

Stuck in my head

- *How can it be that mathematics, being after all a product of human thought which is independent of experience, is so admirably appropriate to the objects of reality?*
- *The mathematician plays a game in which he himself invents the rules while the physicist plays a game in which the rules are provided by nature, but as time goes on it becomes increasingly evident that the rules which the mathematician finds interesting are the same as those which nature has chosen*
- *Science is not only compatible with spirituality; it is a profound source of spirituality. When we recognize our place in an immensity of light-years and in the passage of ages, when we grasp the intricacy, beauty, and subtlety of life, then that soaring feeling, that sense of elation and humility combined, is surely spiritual. So are our emotions in the presence of great art or music or literature, or acts of exemplary selfless courage such as those of Mohandas Gandhi or Martin Luther King, Jr. The notion that science and spirituality are somehow mutually exclusive does a disservice to both.*
- *Whatever they ask you to do, do it as well as you possibly can*
- *Never forget that Shell is just a game*
- *The higher you get, the less logic matters*
- *If I know anything, it's that I know nothing*

How to take a good career step?

How to take a good career step?



- Who am I really?
- What do I need?
- What do I want?
- What motivates me?

- Who are they really?
- What do they need?
- What do they want?
- What motivates them?

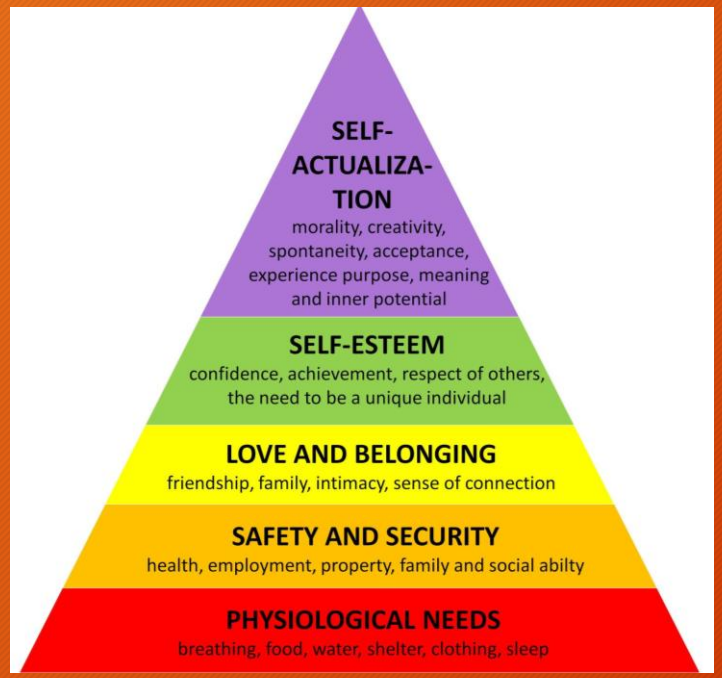
The things I enjoy give me energy => actively seek these out
The things I dislike sap my energy => avoid too much of these

Find a role that allows me to be (or become) “**my best self**”

Me

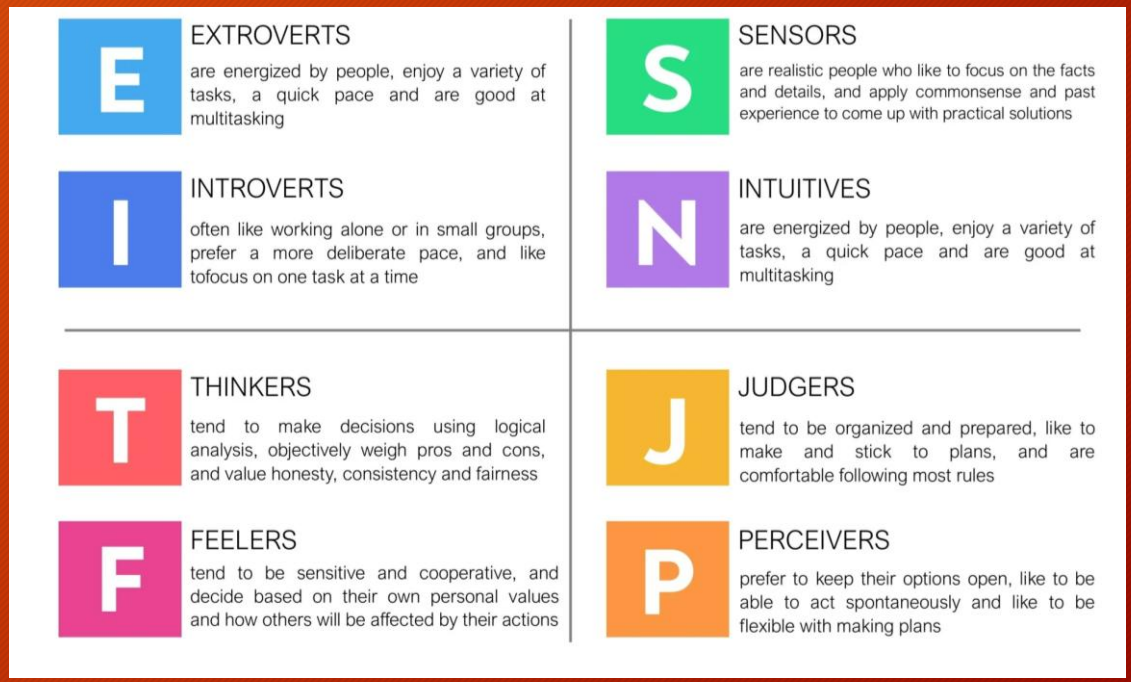
https://www.simplypsychology.org/maslow.html

Maslow hierarchy of needs



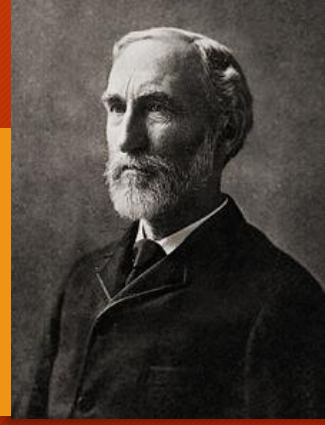
https://link.springer.com/article/10.1007/s42001-022-00178-4

Myers-Briggs personality



Phil: +solving problems; +thinking about things; +maths; +likes fun; -hierarchies; -stupid rules; Welsh / Czech; **ENTP**

Things that enable me

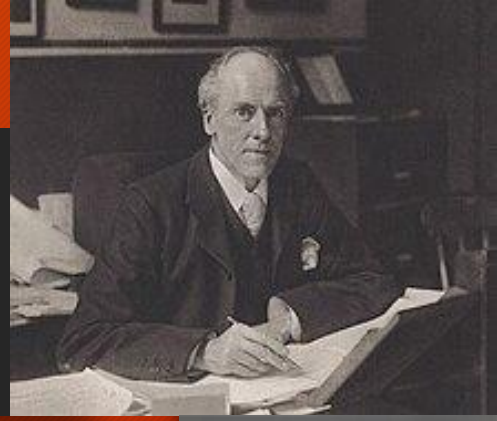


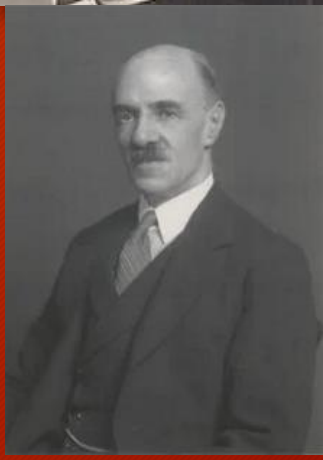
- Capacity (personal, professional, technical)
- “Achievement” focus
- Relationship and communication skills

(Large organisations have systems to assess all these)

- Resilience : come back stronger from set-backs (e.g. Gareth Southgate Dimbleby lecture)
- “Emotional bank account”
- Belief system
- “Culture” and “network”: strong **role models** and friendships I can rely on
- **Work is far from being everything** : there’s a lot more to life than work
- Making my own luck

What does my employer need & want?





Industry

- Economic competitiveness
- Shareholder approval
- Technical edge
- HSE and financial compliance

➢Applied research and impact

Academia

- Academic competitiveness
- Economic stability
- Teaching (TEF)
- Research (REF)

➢Publications in the right journals

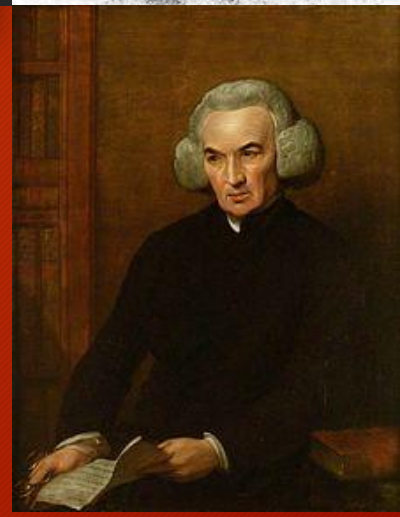
Why do employers want these things? (prevailing economic dogma : “growth”)

Hence, what are different employers likely to be like? Are they a good fit for me?

Tell-tale signs during initial engagement

- Use of interview “assessment” tools (=> hierarchy, “process obsessed organisations”, “HR dominated”)
- Who is present at interview? (more senior => they are serious)
- How generous are interview expenses? (hotels, trains, meals : generous now => generous later)
- Level of **personal** engagement (care about me now => they will in future)
- Level and relevance of technical questions (more **precision** => they know their stuff)
- Ask about CPD, conferences, training, publications and “progression” (**vague answers => no plan**)
- Ask how **critical** R&D is, how funded and organised, **how do I get funding**? (vague answers => no R&D)
- Ask about size of statistics and data science teams; beware “lone statistician” syndrome
- Talk to people in prospective team. Are they “like me”? Technically? Personally?
- Look online to see what other applicants say!
- An interview is an **opportunity for me to interview my prospective employer**; clever employers know and value this
- Teach myself to be good at assessment centres and interviews!
- **Treat a job as a post-doc** (an internship can be a good way to get to know my prospective employer)
- **Vague answers to important questions => red flag**

What my technical colleagues in industry say



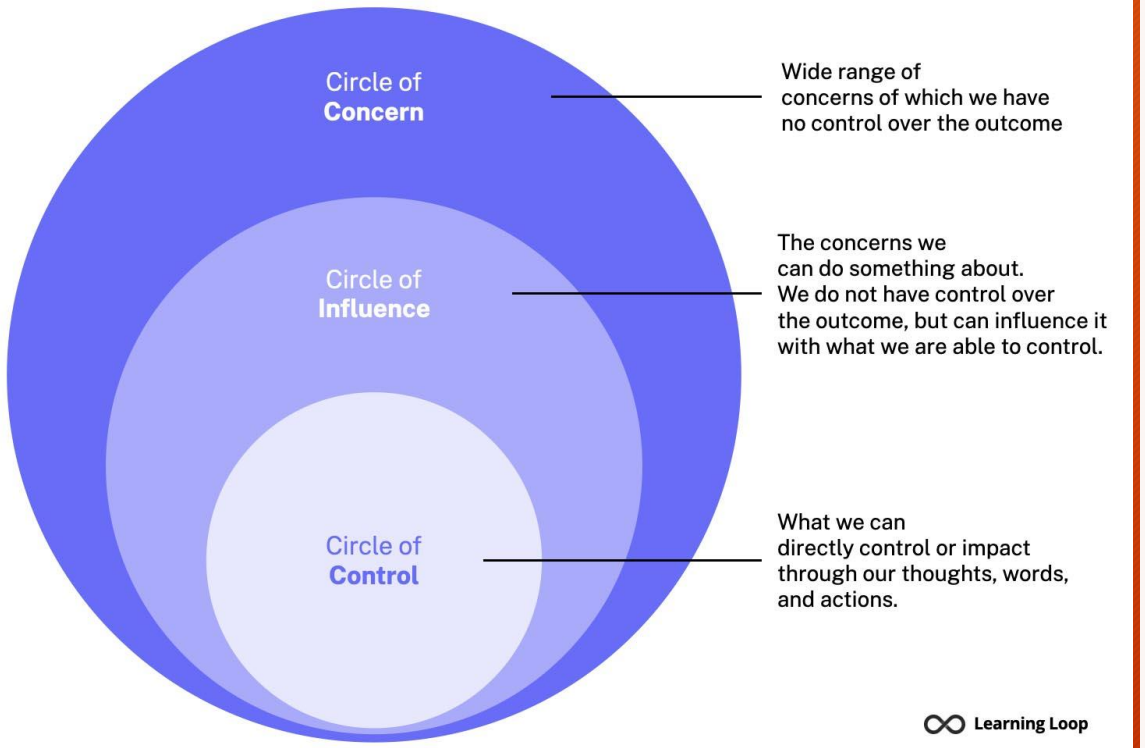
Industry

- Applied research, project variety, nice data
- Focus : “Real world” impact
- Teamwork is critical, rarely work alone
- More money (?), better pension (?), more financial stability
- More 9-5 structure, more “normal”, better work-life balance
- More transactional (?)
- Live where I want to (?)
- Keep clients and managers happy
- Reorganisations (Interarrival time = 3 years)

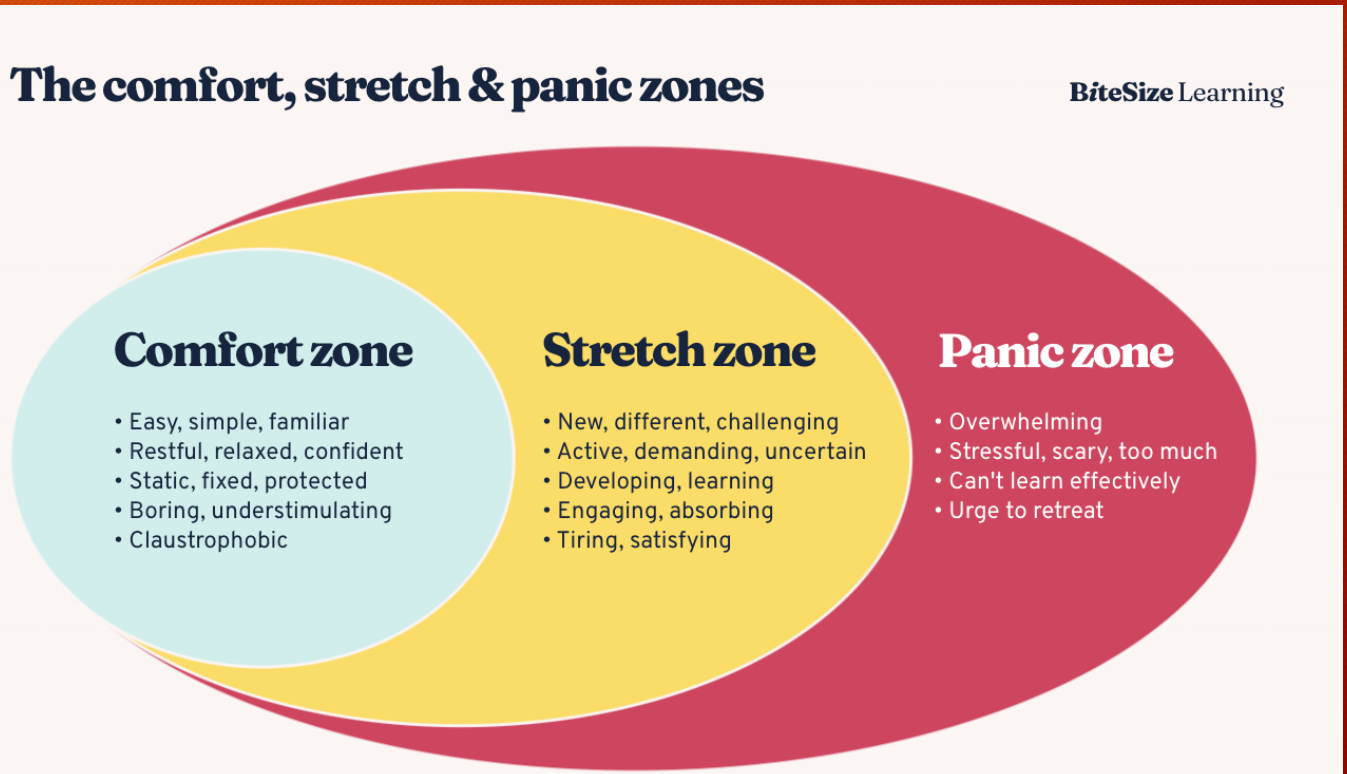
Academia

- Academic research, narrow field
- Focus : Publications
- Emphasis on self and own research, can be lonely
- More freedom (?)
- Hard to balance research and “life”
- Deeper friendships (?)
- Move from one city to another every 3 years to get next job (?)
- Write grant proposals, manage students
- Cycles (annual, triennial)

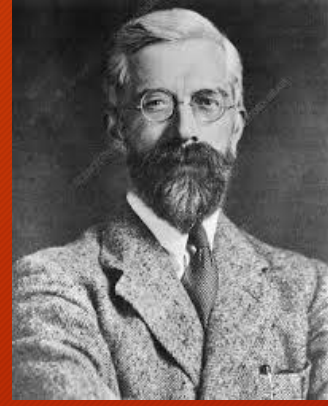
Understanding my limits



https://learningloop.io/glossary/circles-of-influence



https://www.bitesizelearning.co.uk/resources/comfort-zone-stretch-zone-panic-zone



How has work as a statistician in industry changed over the past 40 years?

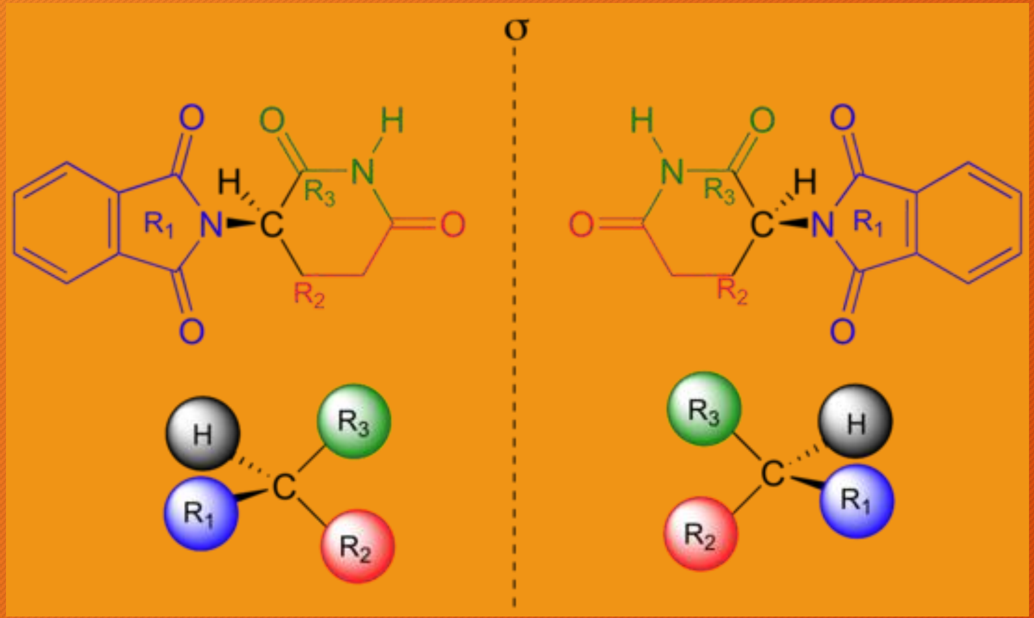


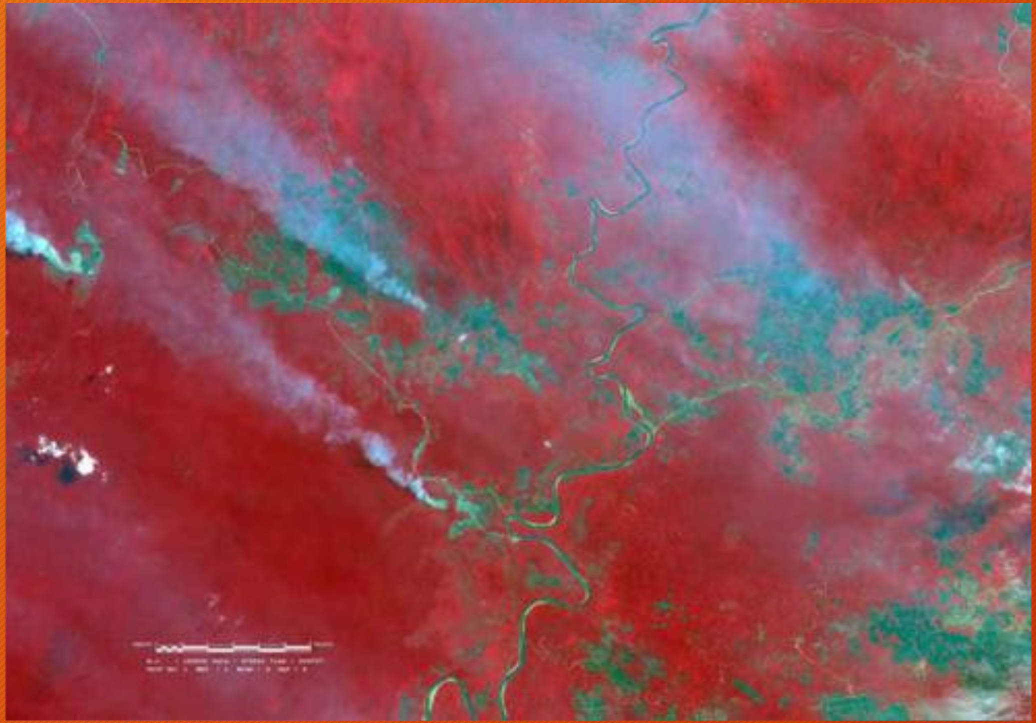






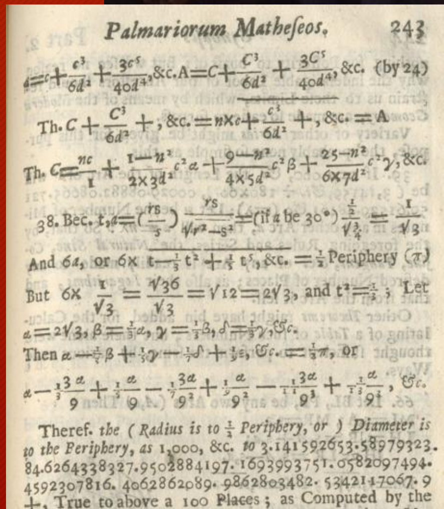
Role and responsibilities; Family and “personal” highlights; who caused the changes?



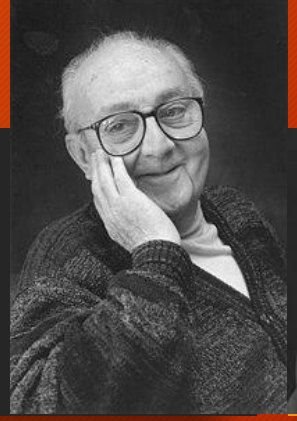


- Ion physics
- Chemical kinetics
- Manufacturing process optimisation
- Single pixel cameras
- Chemometrics and QSAR
- Change-point analysis
- Ancient writing systems
- Volcanology
- Limit lines in geography

- Statistical training

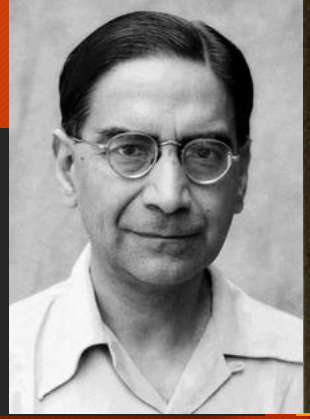


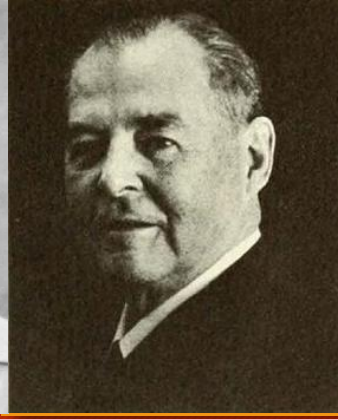
Changes in computational statistics



- Linear algebra: S (late 80s), SAS/IML (late 80s), MATLAB & R (late 90s)
- Parallel computing seen as holy grail (late 80s)
- Tree classifiers (late 80s)
  - Forerunner of random forests
- Neural networks (late 80s)
  - Shell had experts working on NN
  - Visited Harwell (formerly research centre for UK Atomic Energy Authority)
- EM algorithm (80s)
  - Forerunner of variational Bayes
- Bootstrapping was everything (late 80s)
- Talks on “Gibbs sampling” and “MCMC” (early 90s); otherwise Bayesian inference was for academics and textbooks only
  - My first tentative MCMC applications (mid 90s; nice Stephen Brooks review 2003)
- “Intelligent Data Analysis” (mid 90s)
  - Forerunner of kernel methods and Gaussian processes
- Graphical models (mid 90s)
  - WinBUGS

Changes in IT / software infrastructure





- FORTRAN (had to compile code before running; 80s)
  - Older colleagues talked about punching cards in Sittingbourne, to be sent by car to London for processing.
- Terrible plotting facilities; gnuplot (80s)
- Early UNIX workstations (SUN) and DEC (VAX, Alpha; all late 80s ish)
- JANET (version of early UK academic internet; mid 80s)
- IBM VM/CMS mainframes and terminals (no email attachments; no maths capability; late 80s)
  - Used to print reports personally, put in envelopes and distribute; and wait for mail man every morning to bring me stuff to read!
  - Phones on desks for people to call
  - People employed for data entry into primitive computer systems (Hidden Figures)
- Windows laptop (heavy as a 3 bricks; mid 90s)
  - I had a Windows / Linux dual boot Toshiba Tecra (which I was in love with! It still boots up!)
- Own Shell email address (early 00s)

Changes in “culture”

- Shirt and tie (80s)
- Own offices (until mid 90s) then open plan
- In the office every day (to early 10s)
  - Employers actually physically relocated people so that they could get to the office, at huge cost
- Genuine hybrid working (since COVID)
  - COVID proved that collocation was not necessary
  - Organisations can minimise real estate footprint

- How will academia and industry change over the **next** 40 years?
  - Will students still relocate to university in future?
  - Why do we have multiple universities essentially duplicating effort on undergraduate education?
  - What will “an ever more inter-connected world” look like?

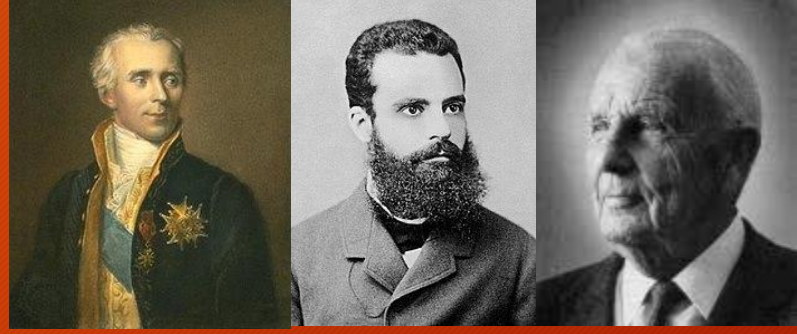
Changes in “work process”

What’s changed?

- Consultancy vs “pipeline”
- Statistics vs “data science”
  - Size of data
  - Speed of data
  - Size and speed of analysis
  - ➢ “Automated human-free inference”

What’s the same?

- Project structure (“DMAIC”, 70s)
- Mathematics, computing, communication



What have I really enjoyed and learned?

… and what did I not like, and what do I wish I'd have known before starting?

Highs and lows

Highs

- Doing applied research with impact; thinking, talking and writing about it
- Working on the interface of industry and academia
- Working “with” and “through” others : being “a boss” was not as terrible as I thought it would be
- Relationships with kind, clever people from all walks of life, backgrounds and technical fields
- Travel and living in different countries
- Some excellent leaders : managers and colleagues who **really** helped me
- Slowly “growing into my shoes”

Lows

- Focus on financial success w.r.t. to arbitrary (?) targets
- Random (?) changes in company focus e.g. energy transition
- Rationalisation, reorganisation, redundancy (every 3 years on average)
- Some poor leaders : managers (in particular) who made a bit of a mess, having been “promoted to the level of their incompetence”
- Mindless (?) bureaucracy: time-writing, chargeability

What did I learn that may be worth passing on?

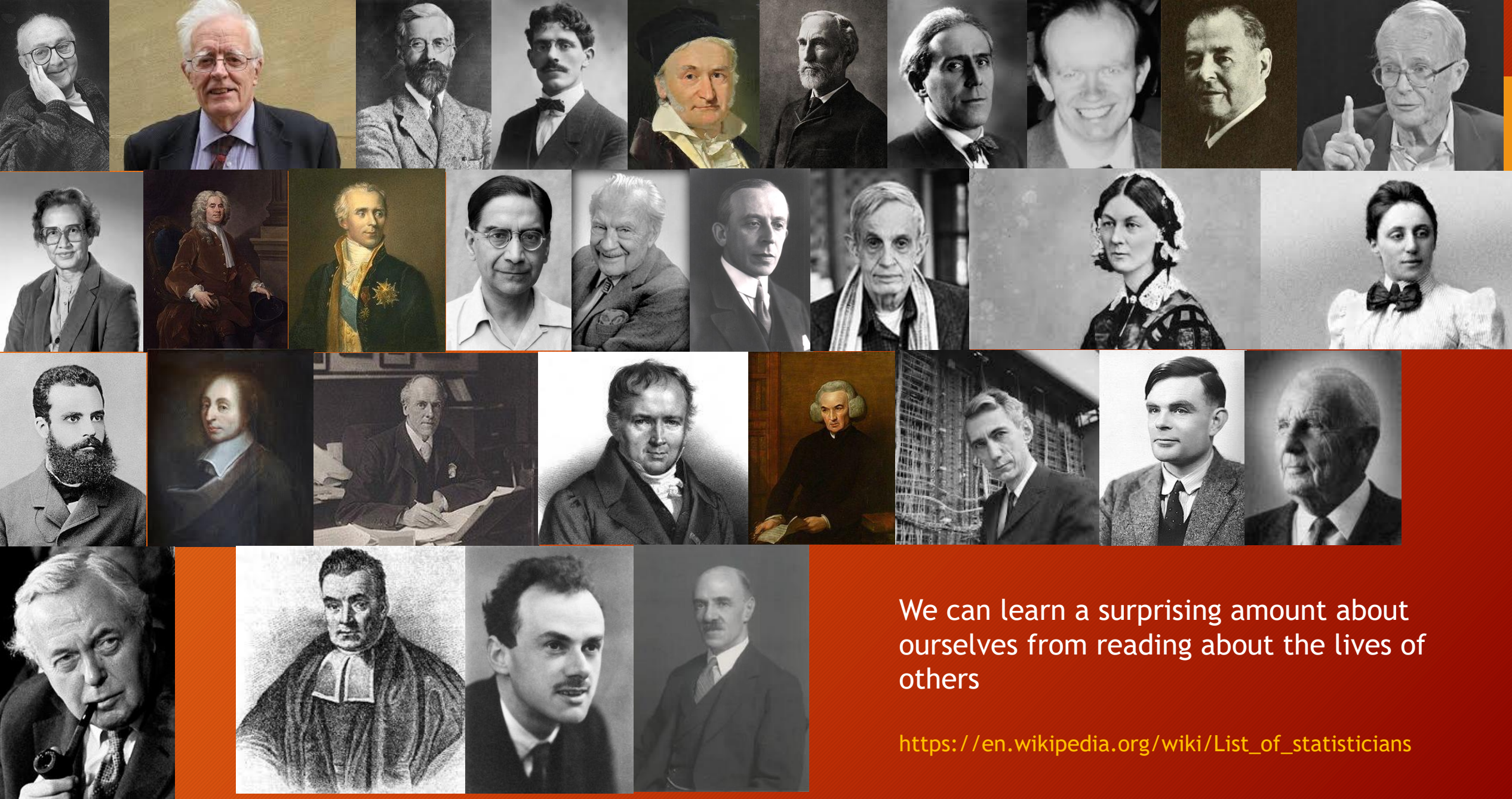
- Success is defined **by me alone**, and by others **only** when I choose to allow it
- I'm ambitious, but my ambitions are not just defined by my work life. I'm ambitious for myself away from work too, and for my family, and my wider "community"
- Don't be afraid to say "yes" : it's usually better to try and fail, than not to try at all
- Don't be afraid to say "no" : at some point (10,000 hours, big life events?) it started to become clear to me that I really **did not** want to take some "opportunities" offered
- Often, there are no wrong answers : all options are OK, so I'll follow my heart!
- Most "career progression" requires taking on responsibility for others, which can be extremely rewarding if done well : "working with and **through** others"
- There are jobs which allow me to combine a life in industry and academia, but I need to be careful in managing my career path
- **Keep publishing** and presenting (keeps me "visible" for a technical future)
- Never stop trying to grow personally, professionally and technically (even in later life)
- And remember, I know nothing : *angels fly because they take themselves lightly*

Being Happy At Work Quotes. QuotesGram

[73 Comics About Happiness That Will Make You Think | Bored Panda]

How to Be Happy: 26 Strategies Backed by Research (njlifehacks.com)

Diolch Děkuji Thank-you!



We can learn a surprising amount about ourselves from reading about the lives of others

https://en.wikipedia.org/wiki/List_of_statisticians