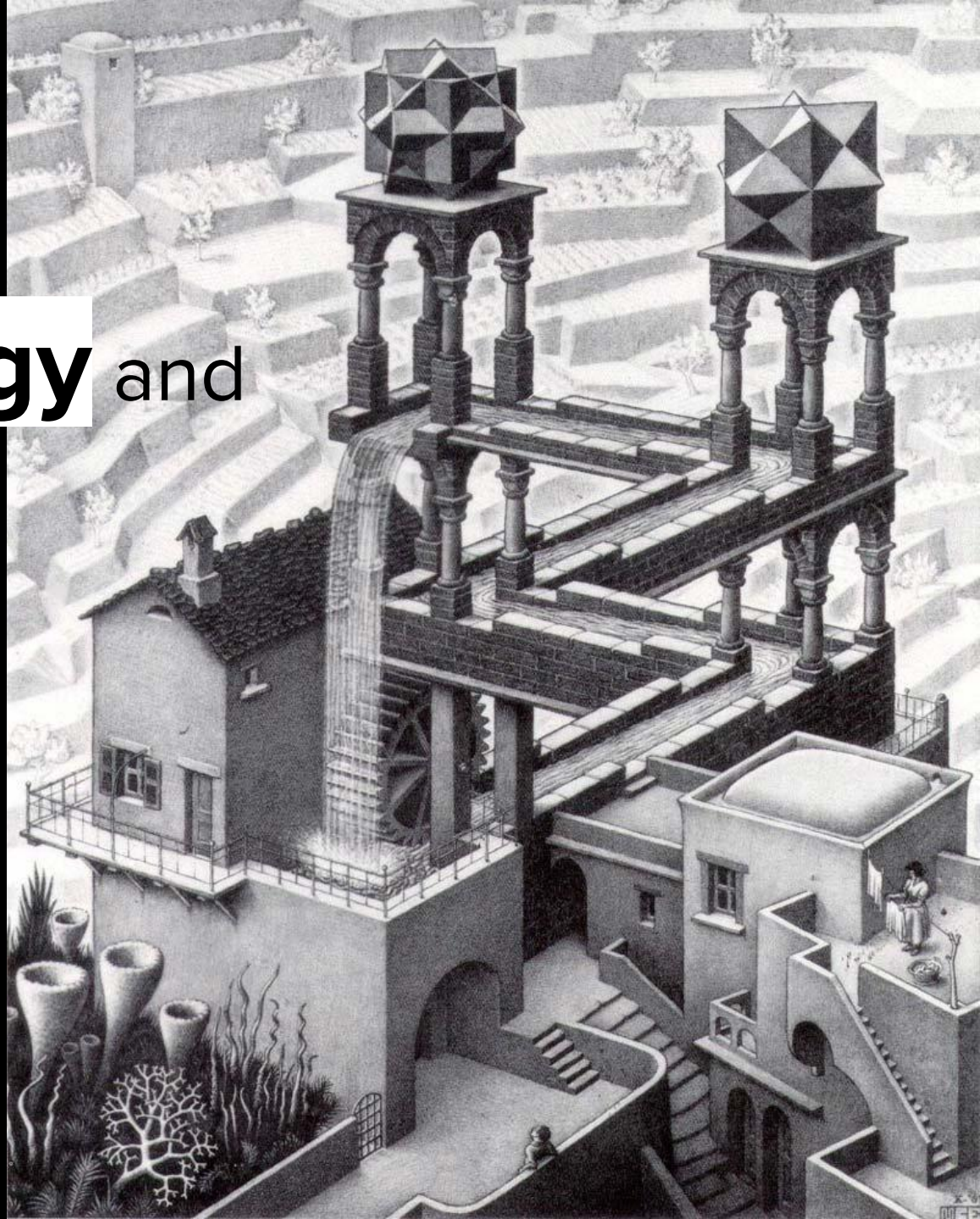
Tutorials in **Epistemology** and **Philosophy** of the **Social Sciences**

François Briatte

Fall 2018

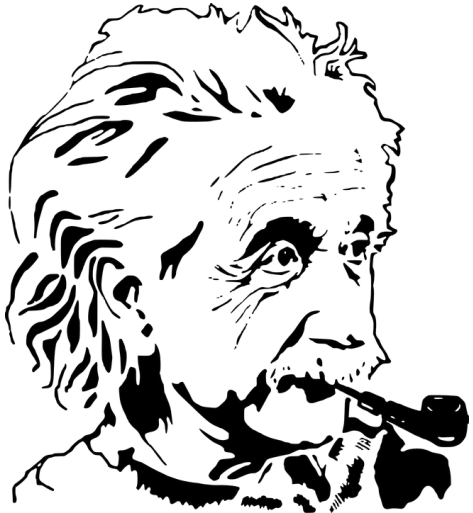


Gravitational wave discoverers win physics Nobel prize

HOW THE FIRST GRAVITATIONAL WAVES WERE FOUND

LIGO and Gravitational Waves: A Graphic Explanation

theory



evidence


Two Black Holes Merge into One
As the black holes circle each other, their intense gravity warps the starlight around them.

This course is about

The first principle is that you must not fool yourself—and you are the easiest person to fool

Richard P. Feynman

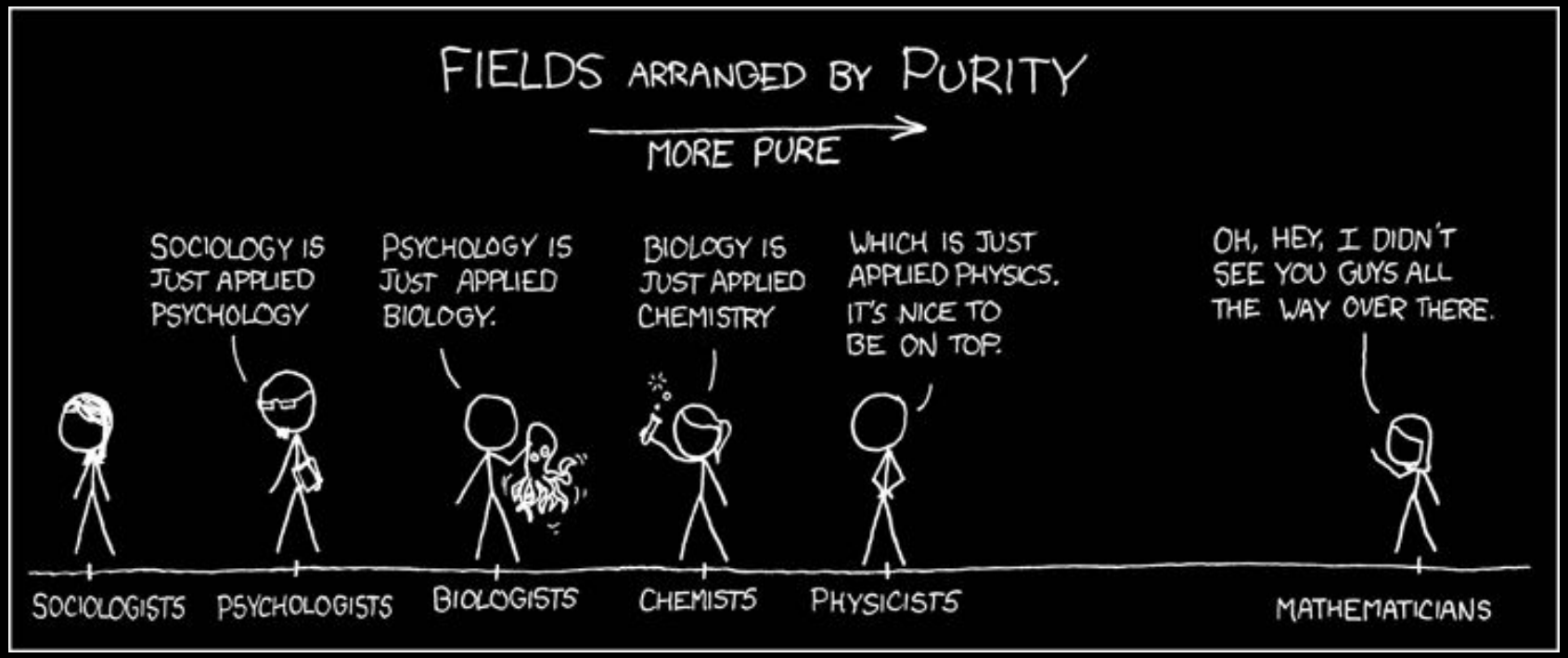
This course is about
social science

Watch at home

Mark Abrahams Keynote,
BAHFest East 2017

Analyzing human behaviour isn’t rocket science. It’s harder than rocket science

Edward R. Tufte



What about political science?

Political science is the study of politics through the procedures of science

Robert O. Keohane

I define *science* as a *publicly known* set of procedures designed to make and evaluate *descriptive and causal inferences* on the basis of the self-conscious application of *methods* that are themselves subject to public evaluation.

All science is carried out with the understanding that any conclusions are *uncertain* and subject to revision or refutation.

Keohane 2009: 359

Course ingredients

Philosophy

Social Science

Methods

and coffee

optional

A mathematician is a machine
for turning coffee into theorems

Paul Erdős

Welcome to the course

Tutorial organization



Course material: `frama.link/epss-2018`

- **Syllabus**

  Check lecture/tutorial numbering and readings

- **Other instructors**

  Matteo Vagelli (lectures), Thomas Bonnin (tutorials), Massimiliano Simons (tutorials)

- **Language**

  Lecture and tutorials are taught **100% in English**

Tutorial rules

- **Readings**

  Do them. Take notes. Come to class.

- **Exams**

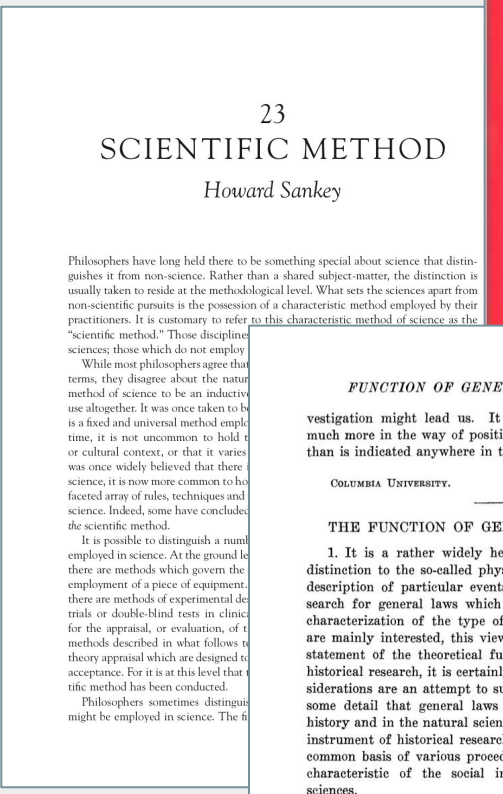
  Midterm + Final, announced in advance during *lectures*

- **Quizzes**

  True/False, announced in advance during *tutorials*

Other tutors might enforce different rules, but none of us handle **absences** – justify them with admin, and catch up

Compulsory readings

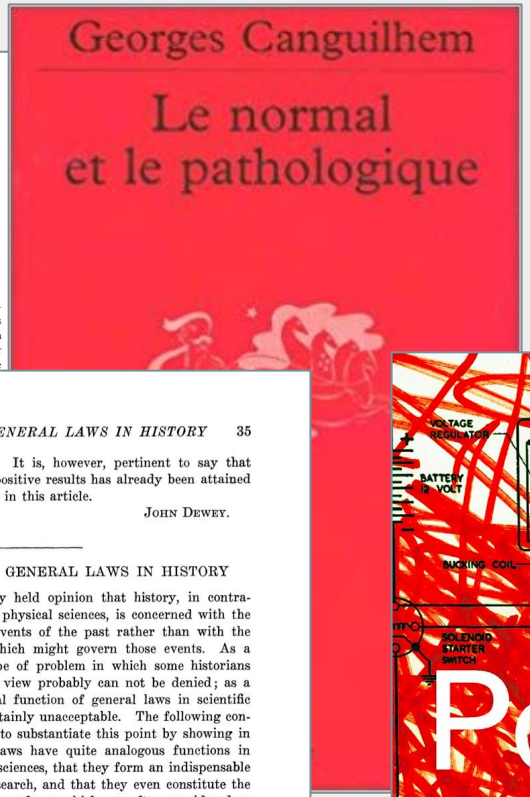


23

SCIENTIFIC METHOD

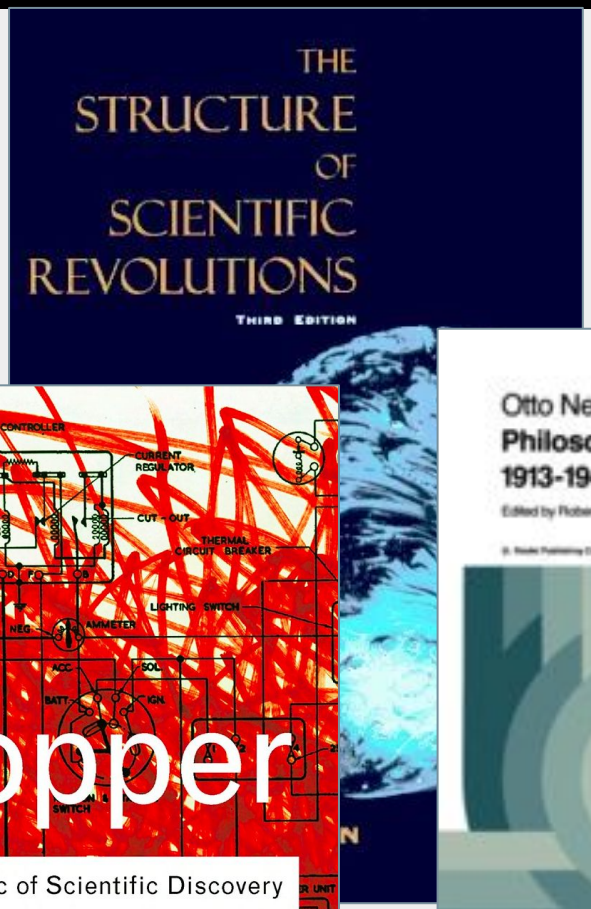
Howard Sankey

Philosophers have long held there to be something special about science that distinguishes it from non-science. Rather than a shared subject-matter, the distinction is usually taken to reside at the methodological level. What sets the sciences apart from non-scientific pursuits is the possession of a characteristic method employed by their practitioners. It is customary to refer to this characteristic method of science as the "scientific method." Those disciplines



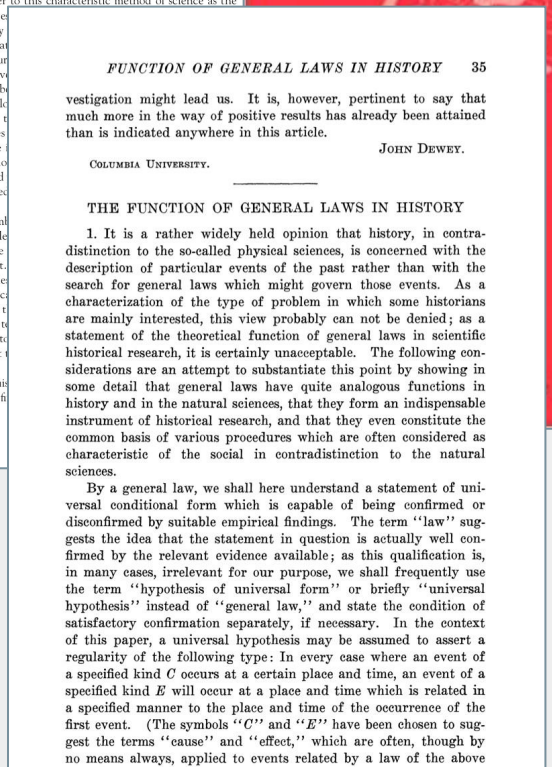
Georges Canguilhem

Le normal et le pathologique



THE STRUCTURE OF SCIENTIFIC REVOLUTIONS

THIRD EDITION



FUNCTION OF GENERAL LAWS IN HISTORY 35

vestigation might lead us. It is, however, pertinent to say that much more in the way of positive results has already been attained than is indicated anywhere in this article.

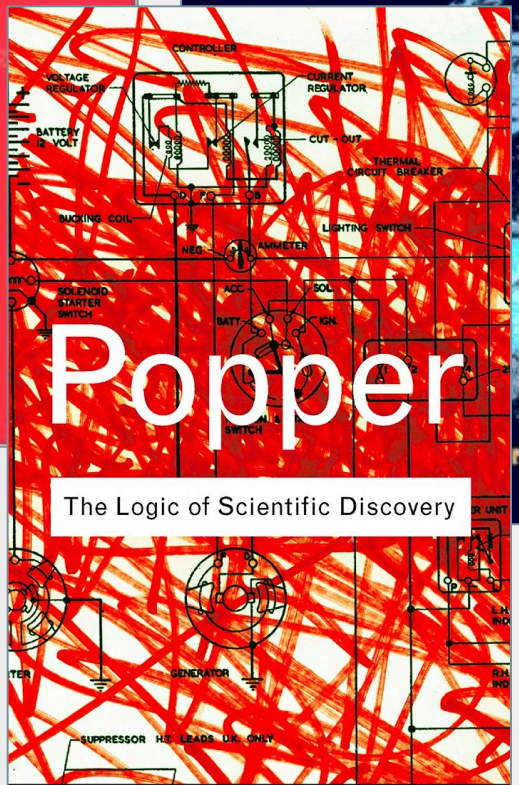
JOHN DEWEY.

COLUMBIA UNIVERSITY.

THE FUNCTION OF GENERAL LAWS IN HISTORY

1. It is a rather widely held opinion that history, in contradistinction to the so-called physical sciences, is concerned with the description of particular events of the past rather than with the search for general laws which might govern those events. As a characterization of the type of problem in which some historians are mainly interested, this view probably can not be denied; as a statement of the theoretical function of general laws in scientific historical research, it is certainly unacceptable. The following considerations are an attempt to substantiate this point by showing in some detail that general laws have quite analogous functions in history and in the natural sciences, that they form an indispensable instrument of historical research, and that they even constitute the common basis of various procedures which are often considered as characteristic of the social in contradistinction to the natural sciences.

By a general law, we shall here understand a statement of universal conditional form which is capable of being confirmed or disconfirmed by suitable empirical findings. The term "law" suggests the idea that the statement in question is actually well confirmed by the relevant evidence available; as this qualification is, in many cases, irrelevant for our purpose, we shall frequently use the term "hypothesis of universal form" or briefly "universal hypothesis" instead of "general law," and state the condition of satisfactory confirmation separately, if necessary. In the context of this paper, a universal hypothesis may be assumed to assert a regularity of the following type: In every case where an event of a specified kind C occurs at a certain place and time, an event of a specified kind E will occur at a place and time which is related in a specified manner to the place and time of the occurrence of the first event. (The symbols "C" and "E" have been chosen to suggest the terms "cause" and "effect," which are often, though by no means always, applied to events related by a law of the above



Otto Neurath

Philosophical Papers 1913-1946

Edited by Robert S. Cohen and Marie Neurath


QUESTIONS


10 minute break

Reading 1

Sankey

23
SCIENTIFIC METHOD

Howard Sankey

Philosophers have long held there to be something special about science that distinguishes it from non-science. Rather than a shared subject-matter, the distinction is usually taken to reside at the methodological level. What sets the sciences apart from non-scientific pursuits is the possession of a characteristic method employed by their practitioners. It is customary to refer to this characteristic method of science as the "scientific method." Those disciplines which employ the scientific method qualify as sciences; those which do not employ the method are considered not to be scientific.

While most philosophers agree that science is to be characterized in methodological terms, they disagree about the nature of this method. Many take the fundamental method of science to be an inductive method. Others belittle induction or deny its use altogether. It was once taken to be virtually axiomatic that the method of science is a fixed and universal method employed throughout the sciences. Yet, at the present time, it is not uncommon to hold that method depends on historical time-period or cultural context, or that it varies from one field of science to another. While it was once widely believed that there is a single scientific method characteristic of all science, it is now more common to hold that the method of science consists of a multi-faceted array of rules, techniques and procedures which broadly govern the practice of science. Indeed, some have concluded that there is, strictly speaking, no such thing as *the* scientific method.

It is possible to distinguish a number of different levels at which methods may be employed in science. At the ground level of data collection and experimental practice, there are methods which govern the proper conduct of an experiment or the correct employment of a piece of equipment. At a slight remove from experimental practice, there are methods of experimental design or test procedure, such as the use of random trials or double-blind tests in clinical trials. At a more remote level are methods for the appraisal, or evaluation, of theories, and possibly theory construction. The methods described in what follows tend, for the most part, to comprise methods of theory appraisal which are designed to provide the warrant for theory choice or theory acceptance. For it is at this level that the bulk of the philosophical debate about scientific method has been conducted.

Philosophers sometimes distinguish between two contexts in which a method might be employed in science. The first context, in which a new idea emerges in the

1 Important notions

- **Scientific method** · p. 248–9

  for data collection, research design and test procedures

  to *discover* and *justify* scientific findings
- **Inductive inference** · p. 249

  “unbiased sense perception to detect observational facts”

  inference – *generalization* through *enumeration*
- **Problems** · p. 249–50

  theory-laden observation and observability

  skepticism — **‘Hume’s problem’**

2 Inductive inference in views on scientific method

- **Two contexts** · p. 249

  use of { facts, theory } for { **discovery, justification** }

- **Naive inductivism** · e.g. Bacon

  induction for ***both*** discovery ***and*** justification

- **Hypothetico-deductivism** · e.g. Hempel

  induction ***not*** for discovery, ***only*** for justification

- **Falsificationism** · esp. Popper

  induction for ***neither*** discovery ***or*** justification

3 Problems with hypothetico-deductivism

- **Inductive skepticism** · p. 251

  still valid here, even if applies only to justification

- **Duhem-Quine problem** · p. 251–2

  initial conditions and auxiliary hypotheses

  generalization rests on ambiguous premises

- **Prediction** · p. 252

  in theory, evidence only should provide **confirmation**

  ≠ in practice, proofs are asymmetric

4 Problems with falsificationism

- **Still inductive in some aspects** · p. 253

  to select the “most highly corroborated” theory

- **Unaligned with historical practice** · p. 254

  theories often survive conflicting evidence

Important critics · p. 255

Kuhn — paradigms and historicity

Feyerabend — epistemological anarchism

Lakatos — sophisticated falsificationism

Reading 2

Russell

[Betrand Russell. 1912. *The Problems of Philosophy*, Williams and Norgate, chapter 6, pp. 93–108]

CHAPTER VI
ON INDUCTION

[93] IN almost all our previous discussions we have been concerned in the attempt to get clear as to our data in the way of knowledge of existence. What things are there in the universe whose existence is known to us owing to our being acquainted with them? So far, our answer has been that we are acquainted with our sense-data, and, probably, with ourselves. These we know to exist. And past sense-data which are remembered are known to have existed in the past. This knowledge supplies our data.

But if we are to be able to draw inferences from these data -- if we are to know of the existence of matter, of other people, of the past before our individual memory begins, or of the future, we must know general [94] principles of some kind by means of which such inferences can be drawn. It must be known to us that the existence of some one sort of thing, A, is a sign of the existence of some other sort of thing, B, either at the same timeas A or at some earlier or later time, as, for example, thunder is a sign of the earlier existence of lightning. If this were not known to us, we could never extend ourknowledge beyond the sphere of our private experience; and this sphere, as we have seen, is exceedingly limited. The question we have now to consider is whether such an extension is possible, and if so, how it is effected.

Let us take as an illustration a matter about which of us, in fact, feel the slightest doubt. We are all convinced that the sun will rise [95] to-morrow. Why? Is this belief a mere blind outcome of past experience, or can it be justified as a reasonable belief? It is not find a test by which to judge whether a belief of this kind is reasonable or not, but we can at least ascertain what sort of general beliefs would suffice, if true, to justify the judgement that the sun will rise to-morrow, and the many other similar judgements upon which our actions are based.

It is obvious that if we are asked why we believe it the sun will rise to-morrow, we shall naturally answer, 'Because it always has risen every day'. We have a firm belief that it will rise in the future, because it has risen in the past. If we are challenged as to why we believe that it will continue to rise as heretofore, we may appeal to the laws of motion: the earth, we shall say, is a freely rotating body, and such bodies do not cease to rotate unless something interferes from outside, and there is nothing outside to interfere with thee earth between now and to-morrow. Of course it might be doubted whether we are quite certain that there is nothing outside to interfere, but this is not the interesting doubt. The interesting doubt is as to whether the laws of motion will remain in operation until to-morrow. If this doubt is raised, we find ourselves in the same position as when the doubt about the sunrise was first raised.

The *only* reason for believing that the laws [96] of motion remain in operation is that

1 More ideas about induction

- **Inductive inference** from sense-data

  generates **predictions** — *x* will *y*

  generates **generalizations** — all *x* will *y*

- **Probabilistic formulation** based on enumeration

  as the number *N* of observed cases of *X* grows,

  expectation of (observing *X* in the future) goes to 1

  in probability theory, $0 < P = E(X) < 1$

2 Problems left to solve

- **Inductive skepticism**

  expectations about the future might be misleading

  induction is resilient to facts (via exceptions to laws)

- **Uniformity of nature**

  observations are cases (instances) of general laws

  how can we identify those laws and their exceptions?

See also – **paradoxes** about induction

Hempel's ravens, **Goodman**'s 'grue' (a.k.a. 'blite')


QUESTIONS

Homework

Read Hempel if you haven't yet done so

Read Neurath

References

Keohane, Robert O. 2009. “Political Science as a Vocation,” *PS: Political Science & Politics* 42(2): 359–63. extra

Sankey, Howard. 2009. “Scientific Method”, in: Psillos and Curd, *The Routledge Companion to the Philosophy of Science*, pp. 248–58. reader

Russell, Bertrand. 1912. “On Induction”, in *The Problems of Philosophy*, Williams and Norgate, chapter 6, pp. 93–108. reader

Extra readings are available on Google Drive and are not compulsory

Links to the Stanford Encyclopedia of Philosophy

Scientific Method § 3. Logic of Method and Critical Responses

The Problem of Induction § 1. Hume's Problem

Nelson Goodman § 5. The Old and the New Riddle of Induction

Wesley Salmon § 2.2 The Justification of Induction

Francis Bacon § 5. *Novum Organum* and the Theory of Induction

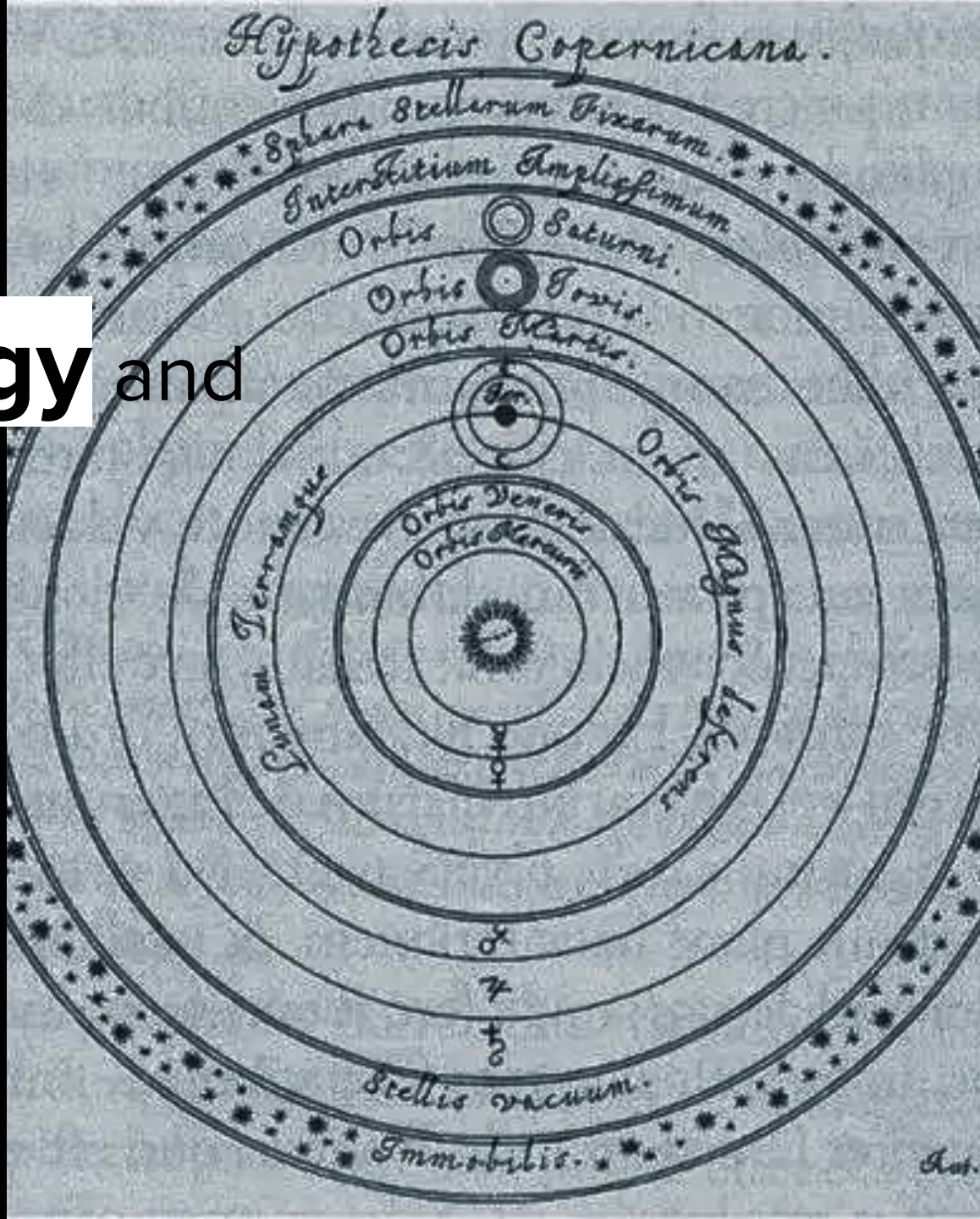
John Stuart Mill § 3.2. Foundations of Theoretical Reason, and
§ 3.3. Sharpening Reason: Philosophy of Science

Links are ordered from most to least relevant or important

Tutorial 2 in **Epistemology** and **Philosophy** of the **Social Sciences**

François Briatte

Fall 2018



Tutorial organization – Reminders

Course material: `frama.link/epss-2018`

- **Syllabus**

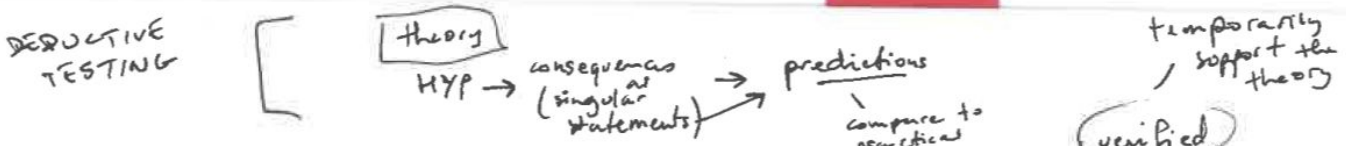
  Check lecture/tutorial numbering and readings

- **Language**

  Lecture and tutorials are taught **100% in English**

- **Read and take notes**

  This course will help you develop your **annotation skills**



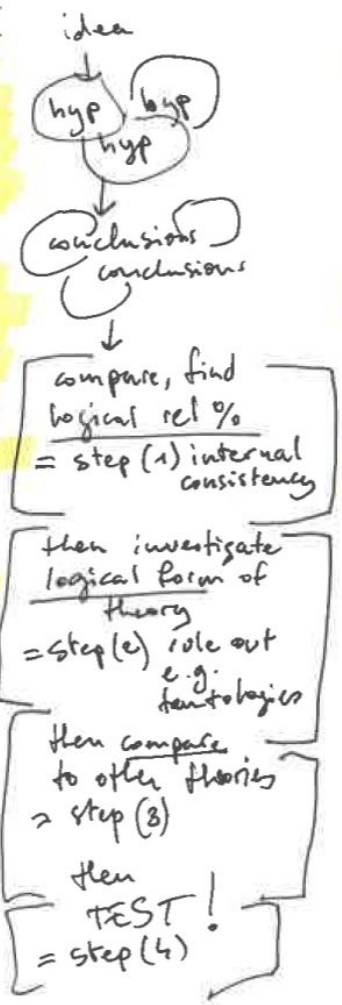
intuition, based upon something like an intellectual love ('Einfühlung') of the objects of experience.'[6]

3 DEDUCTIVE TESTING OF THEORIES

According to the view that will be put forward here, the method of critically testing theories, and selecting them according to the results of tests, always proceeds on the following lines. From a new idea, put up tentatively, and not yet justified in any way—an anticipation, a hypothesis, a theoretical system, or what you will—conclusions are drawn by means of logical deduction. These conclusions are then compared with one another and with other relevant statements, so as to find what logical relations (such as equivalence, derivability, compatiblity, or incompatibility) exist between them.

We may if we like distinguish four different lines along which the testing of a theory could be carried out. First there is the logical comparison of the conclusions among themselves, by which the internal consistency of the system is tested. Secondly, there is the investigation of the logical form of the theory, with the object of determining whether it has the character of an empirical or scientific theory, or whether it is, for example, tautological. Thirdly, there is the comparison with other theories, chiefly with the aim of determining whether the theory would constitute a scientific advance should it survive our various tests. And finally, there is the testing of the theory by way of empirical applications of the conclusions which can be derived from it.

The purpose of this last kind of test is to find out how far the new consequences of the theory—whatever may be new in what it asserts—stand up to the demands of practice, whether raised by purely scientific experiments, or by practical technological applications. Here too the procedure of testing turns out to be deductive. With the help of



[6] Address on Max Planck's 60th birthday (1918). The passage quoted begins with the words, 'The supreme task of the physicist is to search for those highly universal laws . . .,' etc. (quoted from A. Einstein, *Mein Weltbild*, 1934, p. 168; English translation by A. Harris: *The World as I see It*, 1935, p. 125). Similar ideas are found earlier in Liebig, *op. cit.*; cf. also Mach, *Principien der Wärmelehre*, 1896, pp. 443 ff. *The German word 'Einfühlung' is difficult to translate. Harris translates: 'sympathetic understanding of experience'.

other statements, previously accepted, certain singular statements—which we may call 'predictions'—are deduced from the theory; especially predictions that are easily testable or applicable. From among these statements, those are selected which are not derivable from the current theory, and more especially those which the current theory contradicts. Next we seek a decision as regards these (and other) derived statements by comparing them with the results of practical applications and experiments. If this decision is positive, that is, if the singular conclusions turn out to be acceptable, or *verified*, then the theory has, for the time being, passed its test: we have found no reason to discard it. But if the decision is negative, or in other words, if the conclusions have been *falsified*, then their falsification also falsifies the theory from which they were logically deduced.

It should be noticed that a positive decision can only temporarily support the theory, for subsequent negative decisions may always overthrow it. So long as theory withstands detailed and severe tests and is not superseded by another theory in the course of scientific progress, we may say that it has 'proved its mettle' or that it is '*corroborated*'*[1] by past experience.

Nothing resembling inductive logic appears in the procedure here outlined. I never assume that we can argue from the truth of singular statements to the truth of theories. I never assume that by force of 'verified' conclusions, theories can be established as 'true', or even as merely 'probable'.

In this book I intend to give a more detailed analysis of the methods of deductive testing. And I shall attempt to show that, within the framework of this analysis, all the problems can be dealt with that are usually called '*epistemological*'. Those problems, more especially, to which inductive logic gives rise, can be eliminated without creating new ones in their place.

4 THE PROBLEM OF DEMARCATION

Of the many objections which are likely to be raised against the view here advanced, the most serious is perhaps the following. In rejecting

*[1] For this term, see note *1 before section 79, and section *29 of my *Postscript*.

Reading 2

Hempel

vestigation might lead us. It is, however, pertinent to say that much more in the way of positive results has already been attained than is indicated anywhere in this article.

JOHN DEWEY.

COLUMBIA UNIVERSITY.

THE FUNCTION OF GENERAL LAWS IN HISTORY

1. It is a rather widely held opinion that history, in contradistinction to the so-called physical sciences, is concerned with the description of particular events of the past rather than with the search for general laws which might govern those events. As a characterization of the type of problem in which some historians are mainly interested, this view probably can not be denied; as a statement of the theoretical function of general laws in scientific historical research, it is certainly unacceptable. The following considerations are an attempt to substantiate this point by showing in some detail that general laws have quite analogous functions in history and in the natural sciences, that they form an indispensable instrument of historical research, and that they even constitute the common basis of various procedures which are often considered as characteristic of the social in contradistinction to the natural sciences.

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2.1 The main function of general laws in the natural sciences is to connect events in patterns which are usually referred to as *explanation* and *prediction*.

1 Important notions

- **General laws** (p. 35)
  If (cause *C*) then (event *E*)
  Purpose = *Explanation* = *Prediction*
  Instruments = *Empirics* + *Logic* ≠ ‘fate’ | ‘spirit’ | chance
- **Unicity of science** (p. 37)
  History = Biology = Physics
  All are concerned with *general*, not *singular*, laws
- **Opposition to** (e.g. p. 9)
  Much of – late 19th, early 20th – social science
  Metaphysics · Psychoanalysis

2 Unity of science

p. 37

But there is no difference, in this respect, between history and the natural sciences: both can give an account of their subject-matter only in terms of general concepts, and history can "grasp the unique individuality" of its objects of study no more and no less than can physics or chemistry.

- **Empirical positivism** · **Vienna Circle**, interwar period
- **Principle of verification** as the criterion of demarcation
  - Scientific statements are **meaningful**, i.e. true | false
  - We know that by subjecting them to **empirical tests**

Example: ‘laws’ in **modern physics**

Maxwell’s continuity equation

- A **flux** *q* is a real physical quantity that can flow or move (e.g. energy, molecules)
- The flux moves according to a **vector field** denoted **j**
- In its differential form, the equation states a **conservation law** (e.g. conservation of electric charge)

$$\frac{\partial \rho}{\partial t} + \nabla \cdot \mathbf{j} = \sigma$$

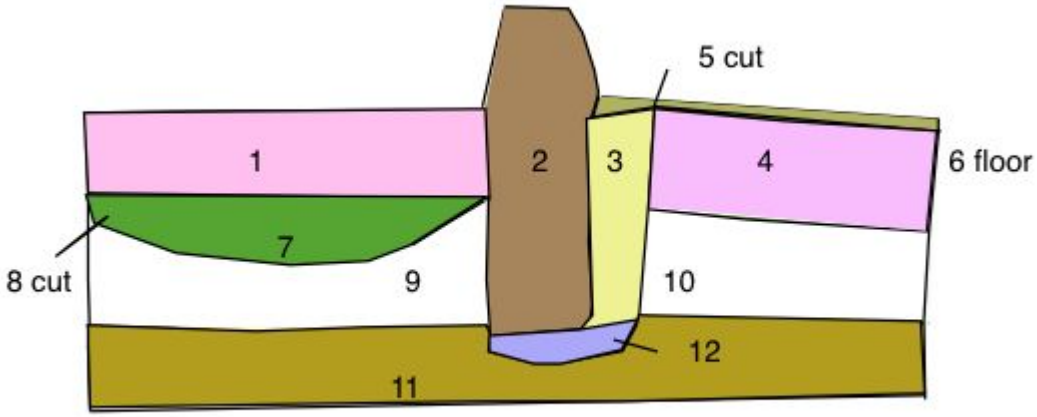
$\frac{\partial \rho}{\partial t}$	Amount of *q* per unit at time *t*
$\nabla \cdot \mathbf{j}$	Divergence of the vector field **j**
σ	Generation of *q* per unit at time *t*

Disclaimer – I have no idea of what this equation really means in either theory or practice. Ask a real physicist.

Example: ‘laws’ in modern archaeology

Principles of stratigraphy

- **Superposition**
  Upper layers are younger than lower ones
- **Original horizontality**
  Layers will initially form horizontally
- **Lateral continuity**
  Layers are bounded at the edges of their basin of deposition



Know thy enemies – classical examples

Astrology

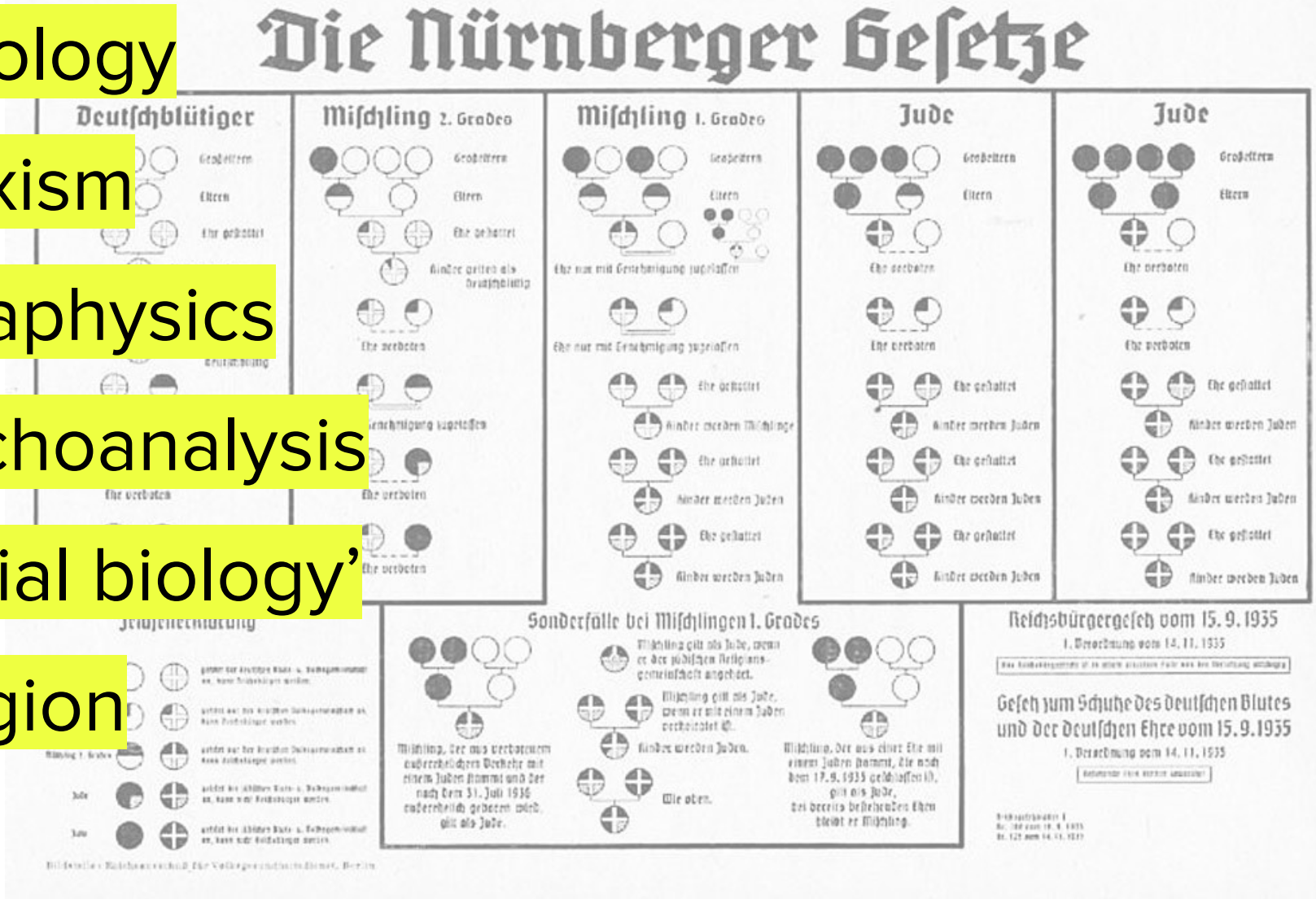
Marxism

Metaphysics

Psychoanalysis

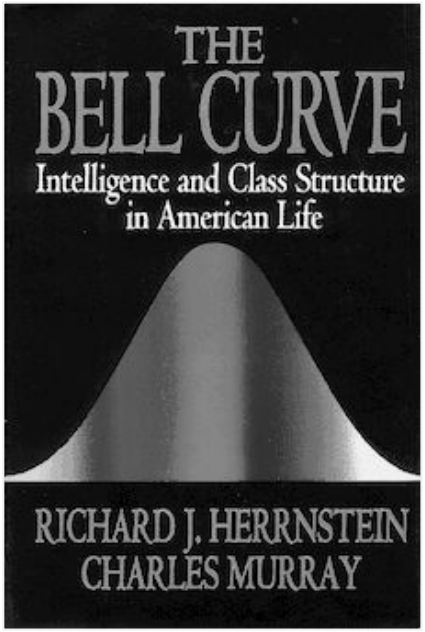
‘Racial biology’

Religion



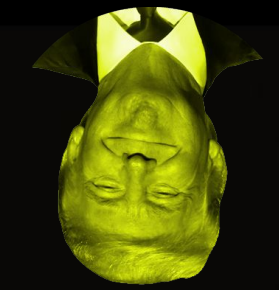
Know thy enemies – contemporary examples

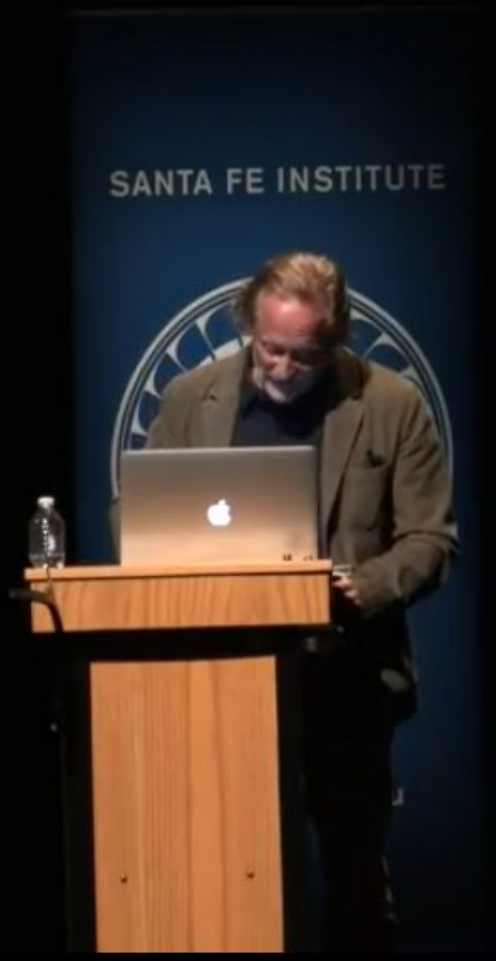
SCIENTOLOGY



Mesdames, si vous allez faire les soldes,
c'est car vous n'avez pas de pénis

Contemporary relevance





… what we stand for at SFI, which is empiricism, science and ideas, as an antidote to superstition, ideology and ignorance, is especially important now.

David Krakauer
Santa Fe Institute, USA
September 2018


QUESTIONS


10 minute break

Reading 4

Neurath

CHAPTER 6

SOCIOLOGY IN THE FRAMEWORK OF PHYSICALISM

1. PHYSICALISM WITHOUT METAPHYSICS

The so-called 'Vienna Circle of the scientific world-conception' attempts to create an atmosphere free of metaphysics, along the lines of Mach, Poincaré, Frege, Russell, Wittgenstein and others in order to further scientific work in all fields by means of logical analysis.[1] It would be less misleading to speak of a 'Vienna Circle of *Physicalism*' because 'world' is not a term of scientific language, and because world-*conception* [Welt*auffassung*] is often taken to be interchangeable with world-*view* [Welt*anschauung*]. All the representatives of this Circle agree that there is no 'philosophy' existing side by side with the sciences as a discipline with its own special statements; all meaningful statements are contained in the sciences.

When the sciences are joined together into *unified science*, the work in them is the same as it previously was in their separation. Their uniform logical character has not always been sufficiently stressed. Unified science is the result of comprehensive *collective work* in the same way as the structures of chemistry, geology, biology or even mathematics and logic.

Unified science will be pursued as the separate sciences in it were formerly, and therefore, the 'thinker without a school' will not be more significant than he was in the former separate sciences. The individual can by sudden flashes of insight achieve here as much or as little as hitherto in any one science. Each proposed innovation must be so formulated that one can expect its general acknowledgment. Only through the cooperation of many others will its full impact become apparent. If it is wrong or meaningless – i.e. metaphysical – then of course it falls outside the sphere of unified science. Unified science, beside which there is no 'philosophy', no 'metaphysics', is not the work of individuals, but of a generation.

Some representatives of the 'Vienna Circle', who, like all other representatives of this group, declare explicitly that one cannot speak of special 'philosophical truths', nevertheless still occasionally use the term 'philosophy'. They want this term to signify 'philosophising', the 'activity of clarifying

Translation of Neurath 1931d [ON 202].

O. Neurath, *Philosophical Papers 1913–1946*

1 Important notions

- **Physicalism** · see also: **reductionism**
  Every object can be reduced to physical object
  Reminiscent of mechanism, 17th-19th c.
  Proposed as a counterpoint to metaphysics
- **Proponents** · see also: **Vienna Circle**
  Russell, Wittgenstein
  Carnap, Russell
- **Unitary position** · see also: **monism**
  There is only one world, and one way to know it
  There is only one science, and one language for it

2 Application to sociology

- **No metaphysics**
  There is no ‘essence’ of things
  There is no ‘Nature v. Culture’ divide
- **Behaviouralism**
  Predictions about animals, individuals, groups
  Search for laws of social behaviour
- **Opponents**
  Sociology and psychology as *Geistwissenchaft*
  Phenomenology and the *Zeitgeist*


QUESTIONS

Next week · **Reading Quiz No. 1**

Texts · Russell, Hempel, Neurath, Popper

Homework

Read Popper

References

Chapoulie, Jean-Michel. 2017. “Les sciences sociales et le modèle des sciences de la nature”, in *Enquête sur la connaissance du monde social. Anthropologie, histoire, sociologie, France-États-Unis, 1950-2000*, Presses Universitaire de Rennes, chapter 2, pp. 51–85. extra

Hempel, Carl G. 1942. “The Function of General Laws in History”, *Journal of Philosophy*, 39 (2), pp. 35–48. reader

Neurath, Otto. 1983 [1931]. “Sociology in the Framework of Physicalism”, in *Philosophical Papers. 1913-1946*, D. Reidel, Dordrecht, pp. 58–90. reader

Extra readings are available on Google Drive and are not compulsory

Links to the Stanford Encyclopedia of Philosophy

Vienna Circle § 2. The Basics (includes historical background)

The Unity of Science § 1.4. Unity and Reductionism in Logical Empiricism

Physicalism § 1. Terminology

Scientific Explanation § 2. [Hempel's] DN [Deductive-Nomological] Model

Carl Hempel § 3.1. The Paradox of Confirmation (on black ravens)

Otto Neurath § 2.2 Neurath's Place in Logical Empiricism (vs. Hempel)

Links are ordered from most to least relevant or important

Links to other Web sources

Daniel Little · *Understanding Society* blog

The Vienna Circle on interdisciplinary science

Neurath on sociology

Recent thinking about scientific explanation

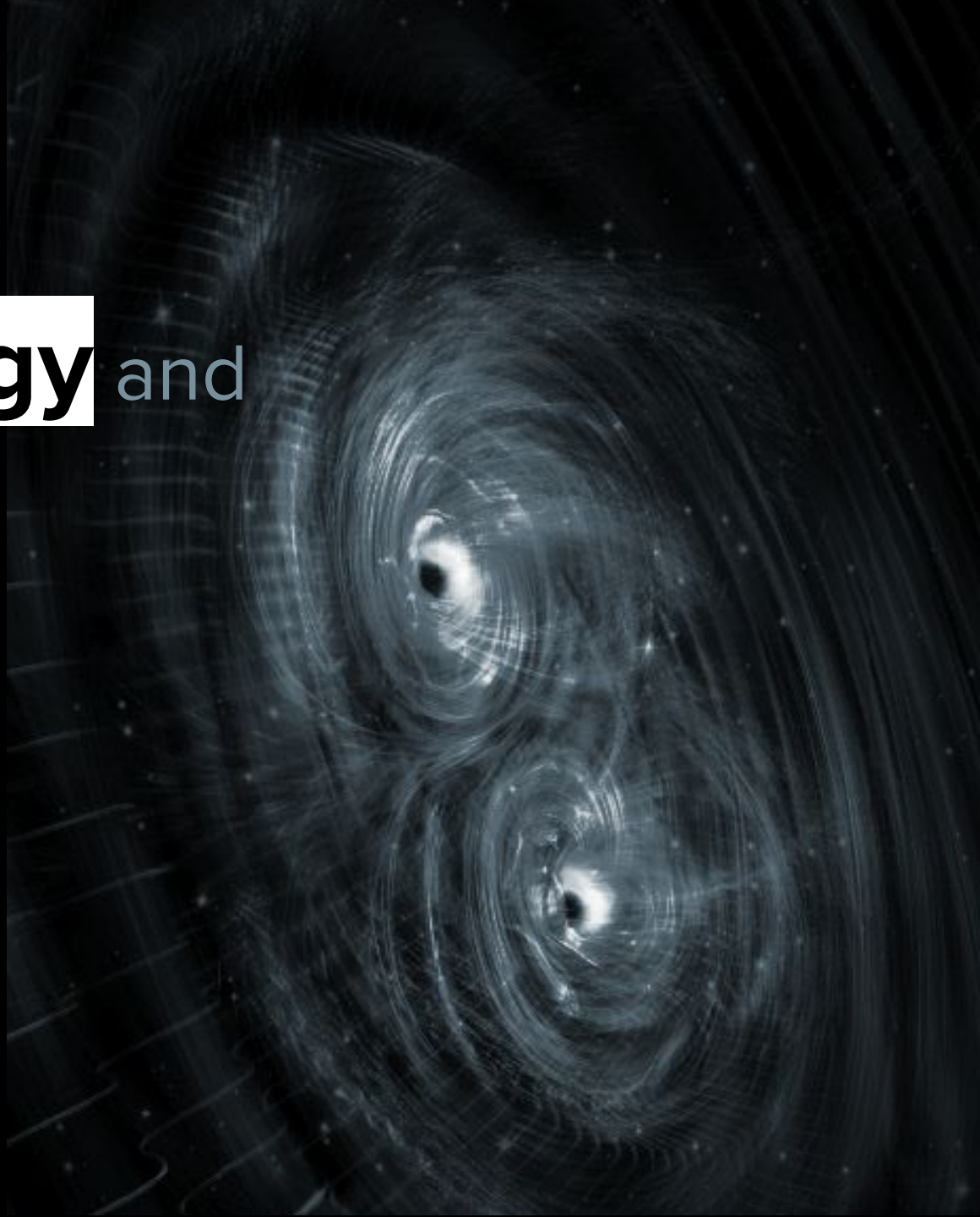
Cosma Shalizi · *Notebooks*

Logical positivism

Otto Neurath, 1882–1945

Links are not ordered in any particular way

Tutorial 3 in Epistemology and Philosophy of the Social Sciences



François Briatte

Fall 2018

Reading 5

Popper

1

A SURVEY OF SOME FUNDAMENTAL PROBLEMS

A scientist, whether theorist or experimenter, puts forward statements, or systems of statements, and tests them step by step. In the field of the empirical sciences, more particularly, he constructs hypotheses, or systems of theories, and tests them against experience by observation and experiment.

I suggest that it is the task of the logic of scientific discovery, or the logic of knowledge, to give a logical analysis of this procedure; that is, to analyse the method of the empirical sciences.

But what are these 'methods of the empirical sciences'? And what do we call 'empirical science'?

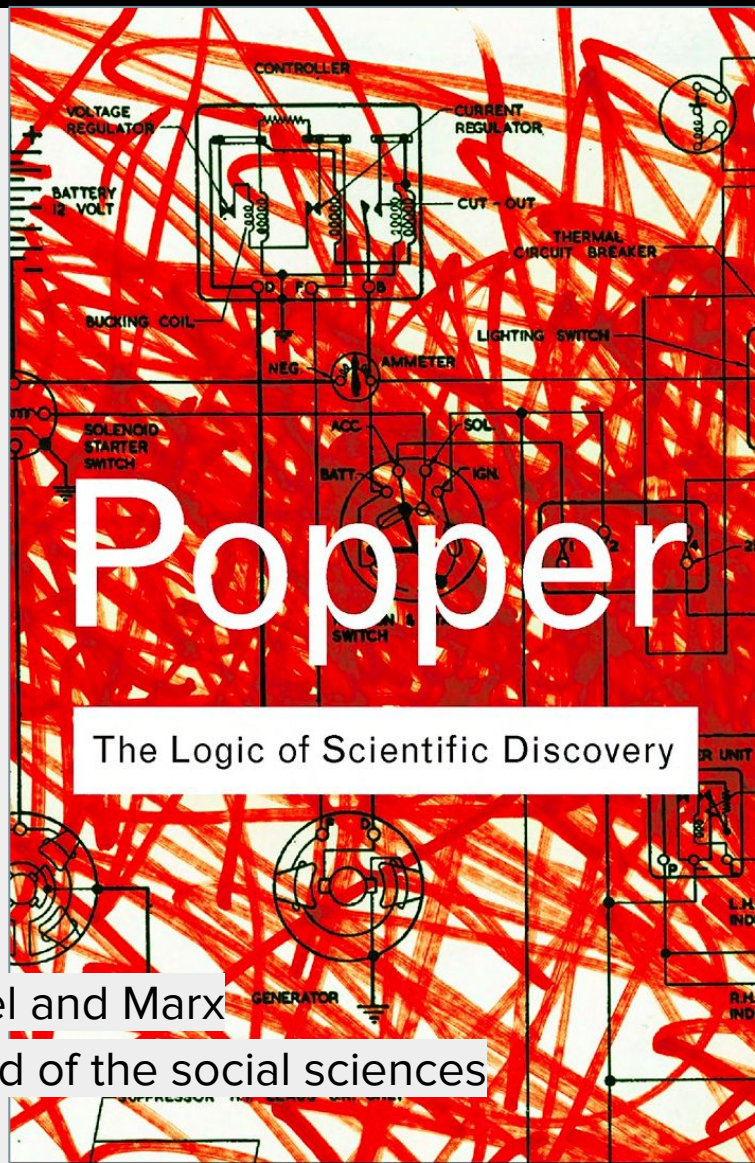
1 THE PROBLEM OF INDUCTION

According to a widely accepted view—to be opposed in this book — the empirical sciences can be characterized by the fact that they use '*inductive methods*', as they are called. According to this view, the logic of scientific discovery would be identical with inductive logic, *i.e.* with the logical analysis of these inductive methods.

It is usual to call an inference 'inductive' if it passes from *singular*

Popper · *Logic of Scientific Discovery* · 1935

- **Inductive inference** does not provide a valid **criterion of scientific demarcation** (≠ Hempel, Vienna Circle)
- **Logical deduction** can be coupled with an alternative one: the **principle of falsification** (≠ Metaphysics, Psychoanalysis)



Also by Popper

The Open Society and its Enemies – on Plato, Hegel and Marx

The Poverty of Historicism – on the scientific method of the social sciences

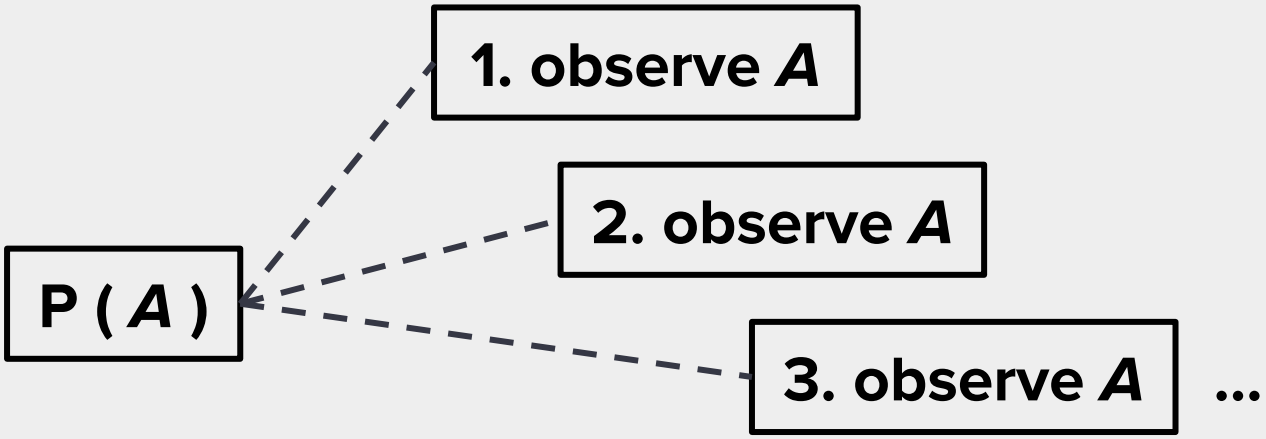
Reminder: induction *v.* deduction

- **Inductive inference** (pp. 3–4)
  From *singular* statements to *universal* statements
  - **Singular** = Observations, Experiments (empirics)
  - **Universal** = Hypotheses, Theories (predictions)
- **Logical deduction** (p. 9)
  From *new ideas* to *conclusions*
  - **New ideas** = Hypotheses (tentative, not yet justified)
  - **Conclusions** = Particular statements (empirical)

N.B. Note that those are **ideal types** – practical examples will contain both logics.

Problem of induction · ‘forward’ version

Prove statement *A*

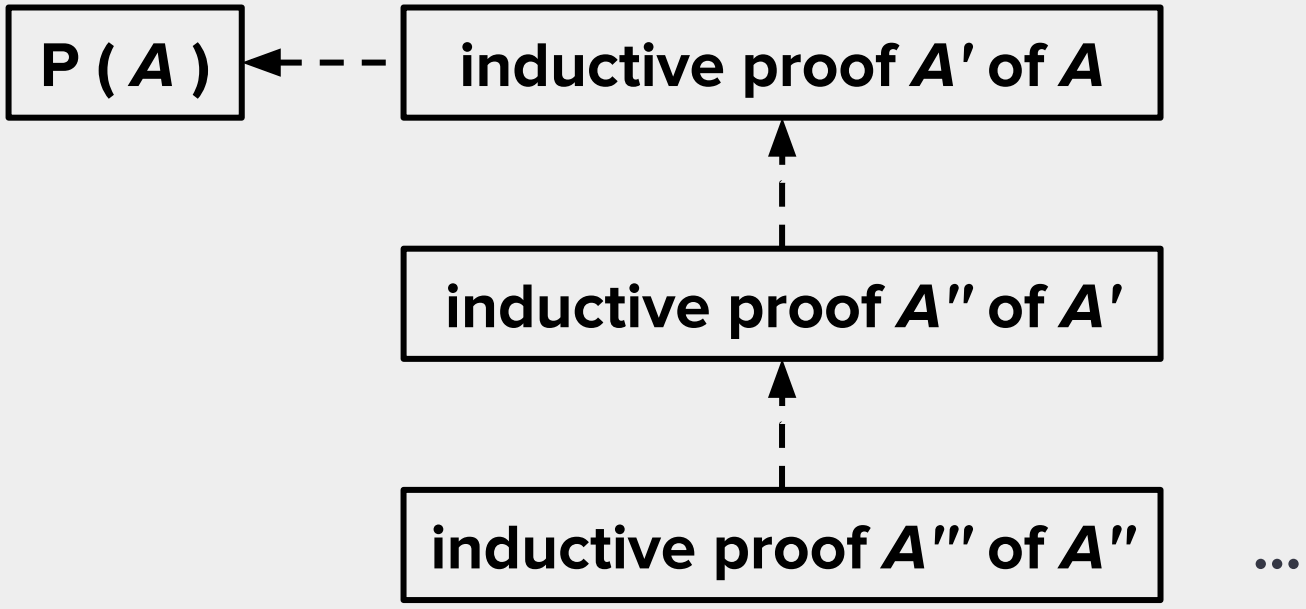


Logical empiricism — ***A* is verified by experience**

Hume, Popper — **obs. 4 = *A* ?** — **Solution is non-finite**

Problem of induction · ‘backward’ version

Prove statement *A*



induction leads to infinite regress

Important notions

- **Problem of induction** (pp. 5–6, p. 11)
  Regardless of the past, **future instances are unknown**
  Grounding truth in experience leads to **infinite regress**
- **Principle of falsification** (p. 10)
  A theory is scientific if it is **refutable by a singular statement**
  Corollary □ Scientific theories are **empirically testable**
- **Fundamental asymmetry** (p. 10)
  Verification requires infinite proofs
  Falsification requires one

Fundamental asymmetry

- **Principle of verification**

  Raven A is black
  Raven B is black
  Raven C is black
  … All ravens are black

  Infinite amounts of proof required
  +
  Conclusion leads to premises,
  rather than the opposite!

- **Principle of falsification**

  P → Q
  ¬ Q
  … ¬ P

  Modus tollens
  (negating the consequent)
  Single proof sufficient

Hypothetico-deductivism

- **Scientific discovery**

  … remains mysterious, even **metaphysical** to some extent

  … whereas scientific **falsification** and **corroboration** are not

  ➜ scientificity applies to ***justification*** *only*

- **Hypotheses**

  1 Initial conditions i.e parameters, like planetary mass

  2 General laws e.g. Kepler's law of planetary motion

- **Cumulativity** i.e **scientific progress**

  Science is the business of killing false theories

  Theories should endure the "fiercest **struggle for survival**"

Empirical refutability

p. 18

I shall certainly admit a system as empirical or scientific only if it is capable of being *tested* by experience.

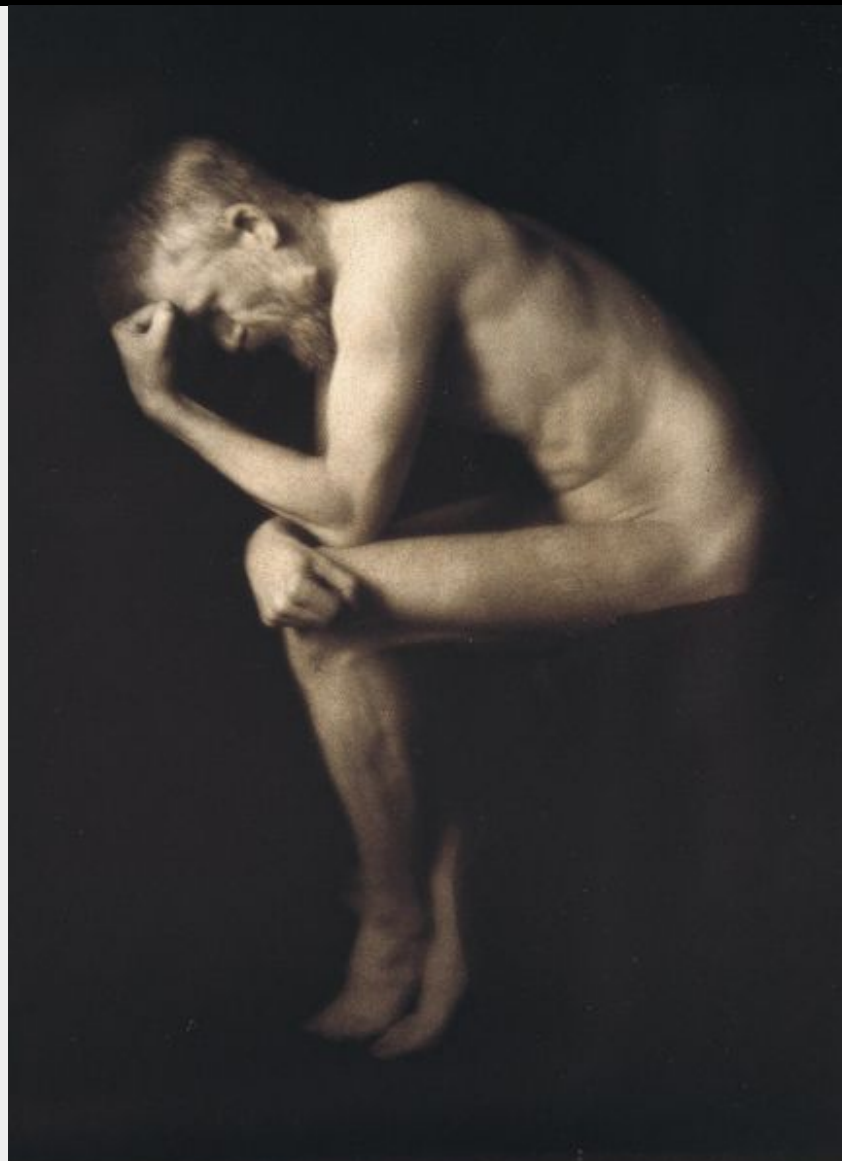
it must be possible for an empirical scientific system to be refuted by experience.

- **Common enemies** · Marxism, most metaphysics
- **Common ingredients** · Logic, Empirics
- **Opposite principles** · Truth *v.* Falsehood

Popper in a nutshell

There can be no ultimate statements in science (p. 25)

- ⇔ We are never assuredly free of error (Agassi 2014: 91)
- ⇔ **Cartesian doubt** – use your own reason, but do not trust yourself (Descartes)
- ⇔ “The first principle is that you **must not fool yourself**—and you are the easiest person to fool” (Feynman)




QUESTIONS

Homework

Read Kuhn if you haven't yet done so

Read Bird if you have the time to

References

Agassi, Joseph. 2014. “The Essential Popper,” in *Popper and His Popular Critics. Thomas Kuhn, Paul Feyerabend and Imre Lakatos*, New York, Springer, pp. 91–8. **extra**

Hempel, Carl G. 1942. “The Function of General Laws in History”, *Journal of Philosophy* 39 (2): 35-48. **reader**

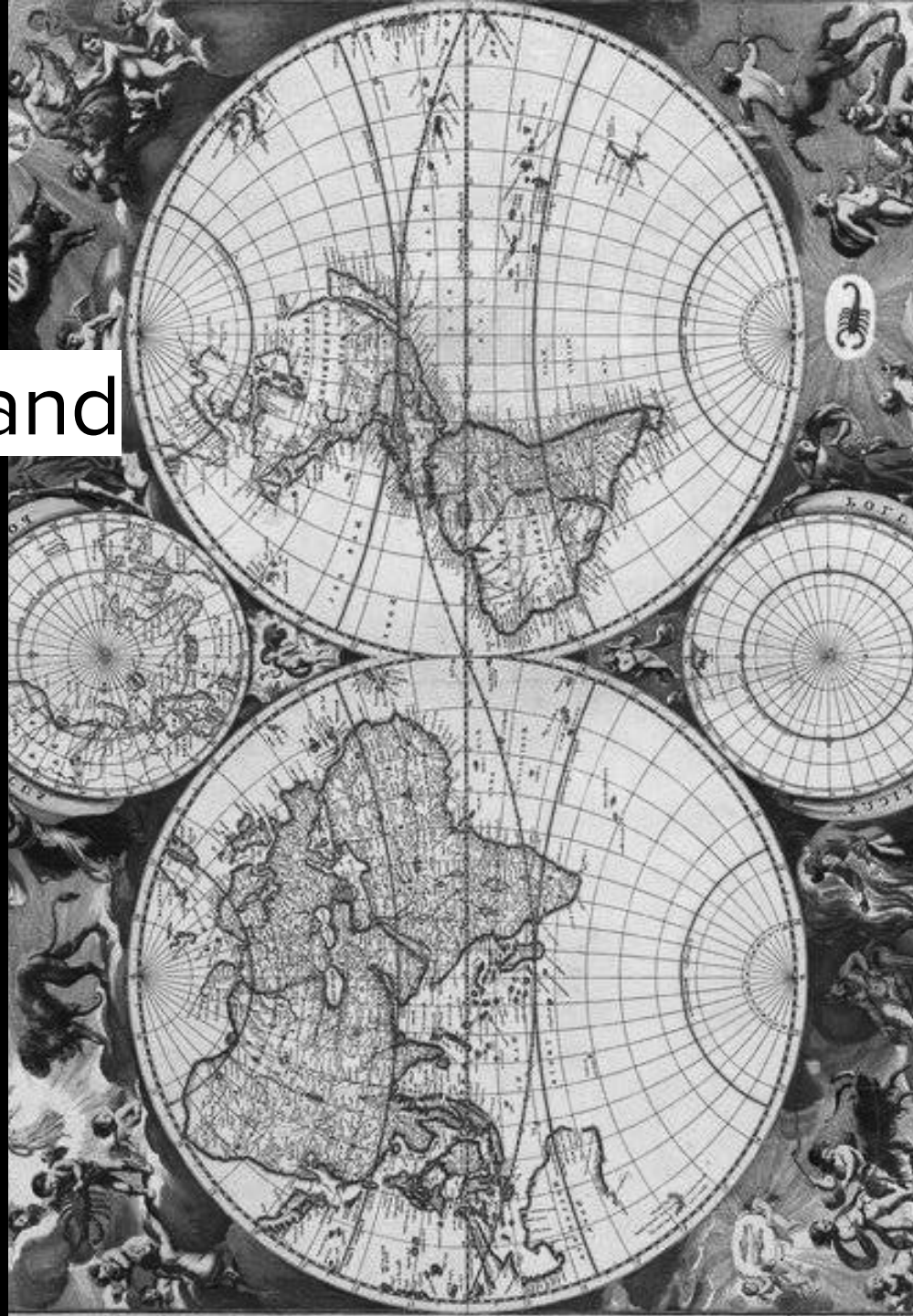
Popper, Karl. [1935] 2002. “A Survey of some Fundamental Problems,” in *The Logic of Scientific Discovery*, London, Routledge, pp. 3–26. **reader**

Extra readings are available on Google Drive and are not compulsory

Tutorial 4 in Epistemology and Philosophy of the Social Sciences

François Briatte

Fall 2018



Reading 6

Kuhn

I. Introduction: A Role for History

History, if viewed as a repository for more than anecdote or chronology, could produce a decisive transformation in the image of science by which we are now possessed. That image has previously been drawn, even by scientists themselves, mainly from the study of finished scientific achievements as these are recorded in the classics and, more recently, in the textbooks from which each new scientific generation learns to practice its trade. Inevitably, however, the aim of such books is persuasive and pedagogic; a concept of science drawn from them is no more likely to fit the enterprise that produced them than an image of a national culture drawn from a tourist brochure or a language text. This essay attempts to show that we have been misled by them in fundamental ways. Its aim is a sketch of the quite different concept of science that can emerge from the historical record of the research activity itself.

Even from history, however, that new concept will not be forthcoming if historical data continue to be sought and scrutinized mainly to answer questions posed by the unhistorical stereotype drawn from science texts. Those texts have, for example, often seemed to imply that the content of science is uniquely exemplified by the observations, laws, and theories described in their pages. Almost as regularly, the same books have been read as saying that scientific methods are simply the ones illustrated by the manipulative techniques used in gathering textbook data, together with the logical operations employed when relating those data to the textbook's theoretical generalizations. The result has been a concept of science with profound implications about its nature and development.

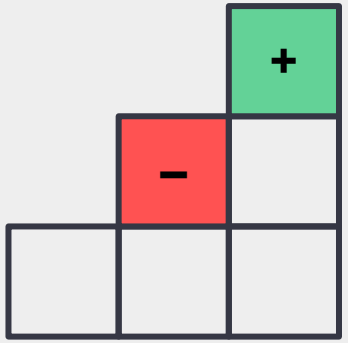
If science is the constellation of facts, theories, and methods collected in current texts, then scientists are the men who, successfully or not, have striven to contribute one or another element to that particular constellation. Scientific development becomes the piecemeal process by which these items have been

Scientific change · pp. 2–3

Incremental ⇔ cumulative, accretive

Science is like **Minecraft**

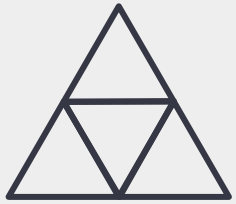
All changes occur **‘one brick at a time’**



Revolutionary ⇔ radical, paradigmatic

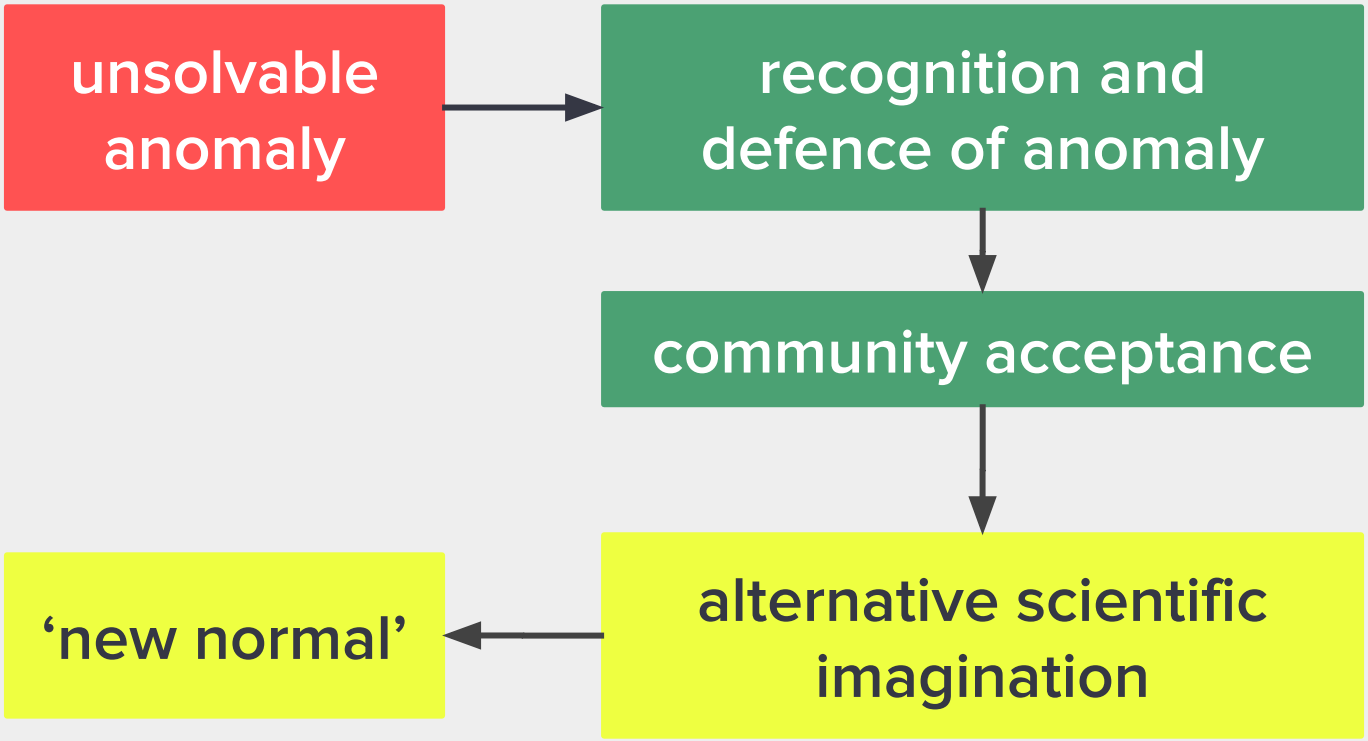
‘Nothing works like before!’

‘Things will never be the same again!’



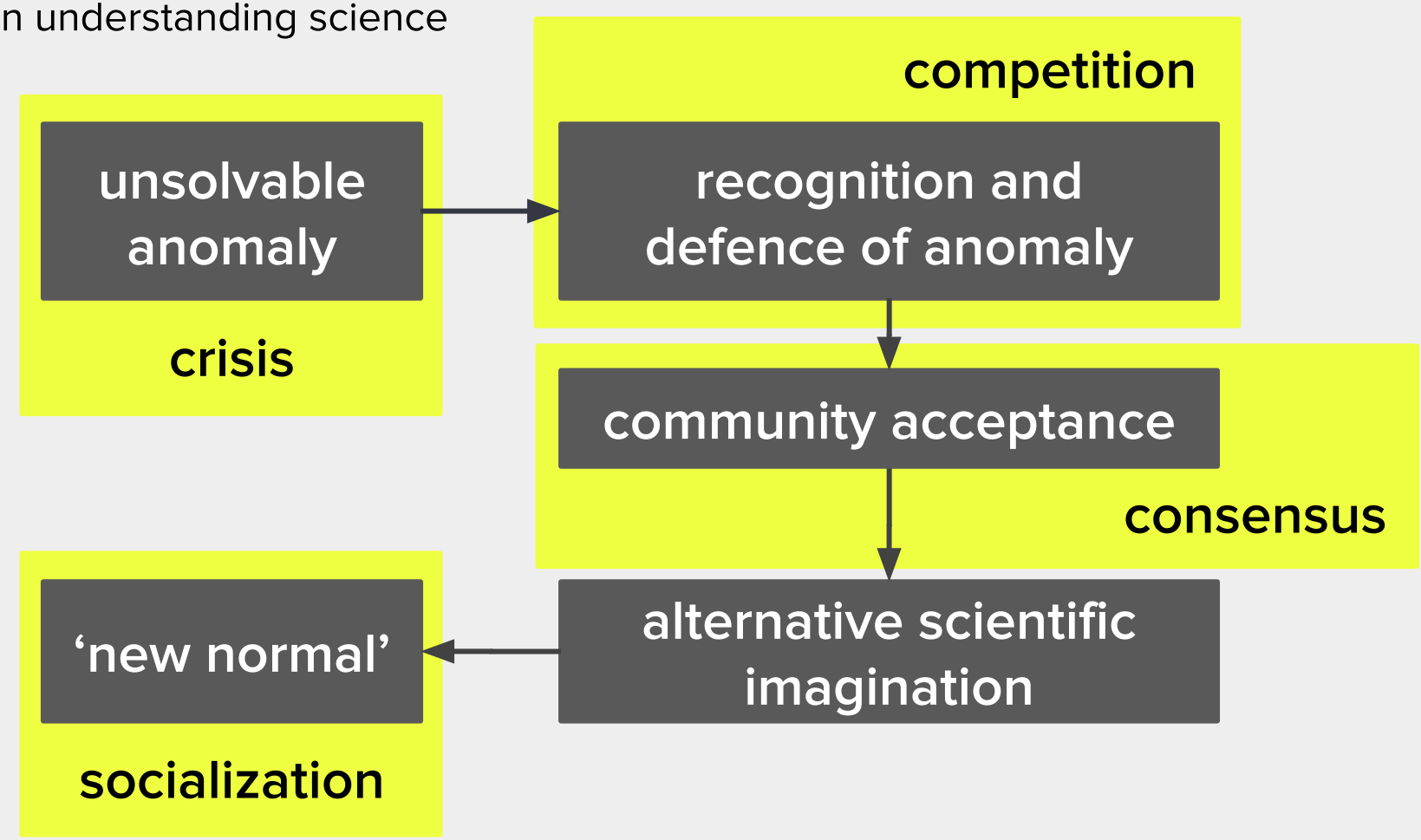
⇔ **Pre- and post-revolutionary ideas are incommensurable to each other**

Steps to revolution · pp. 5–6

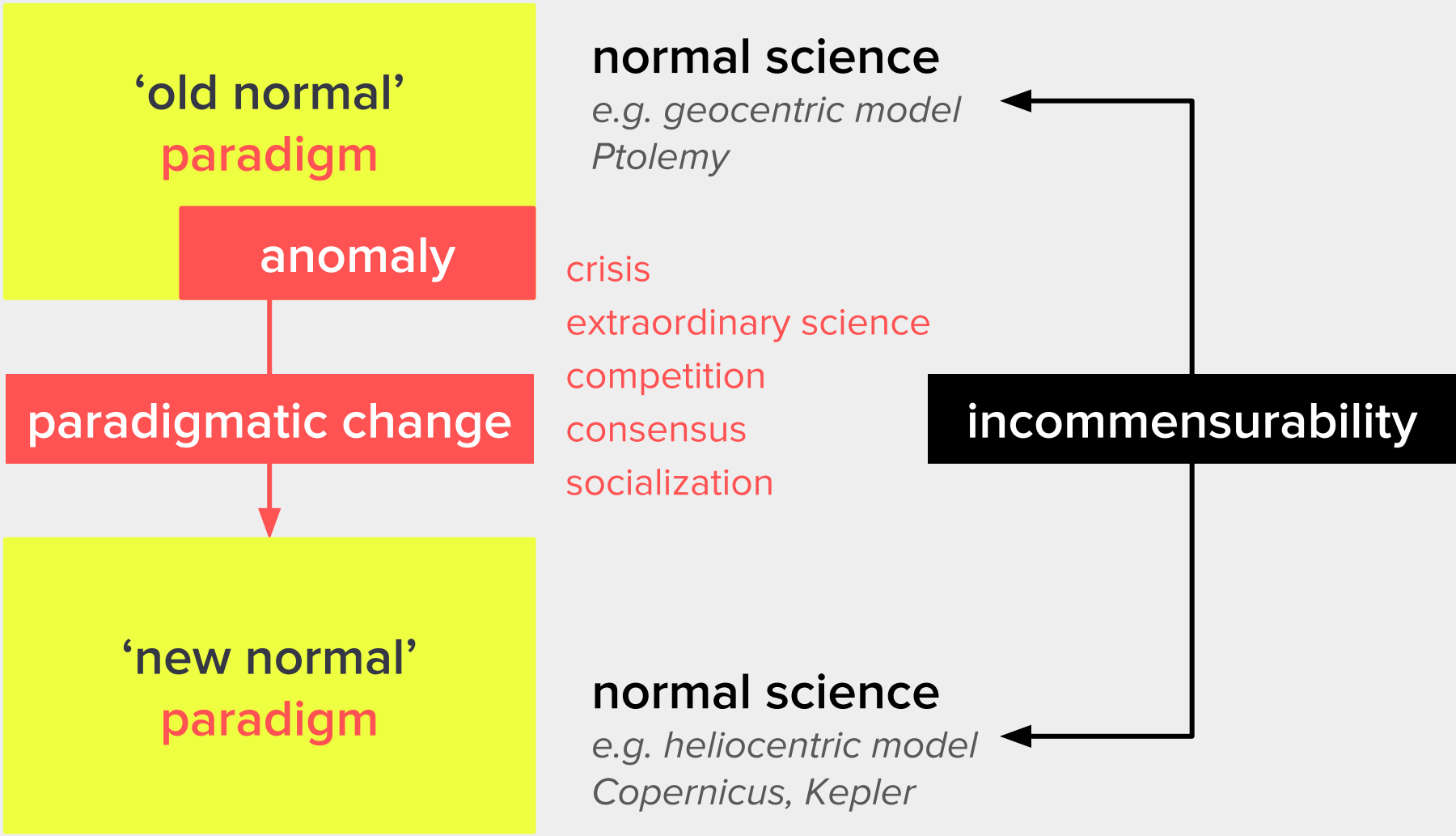


Sociological processes · pp. 4–5, 8

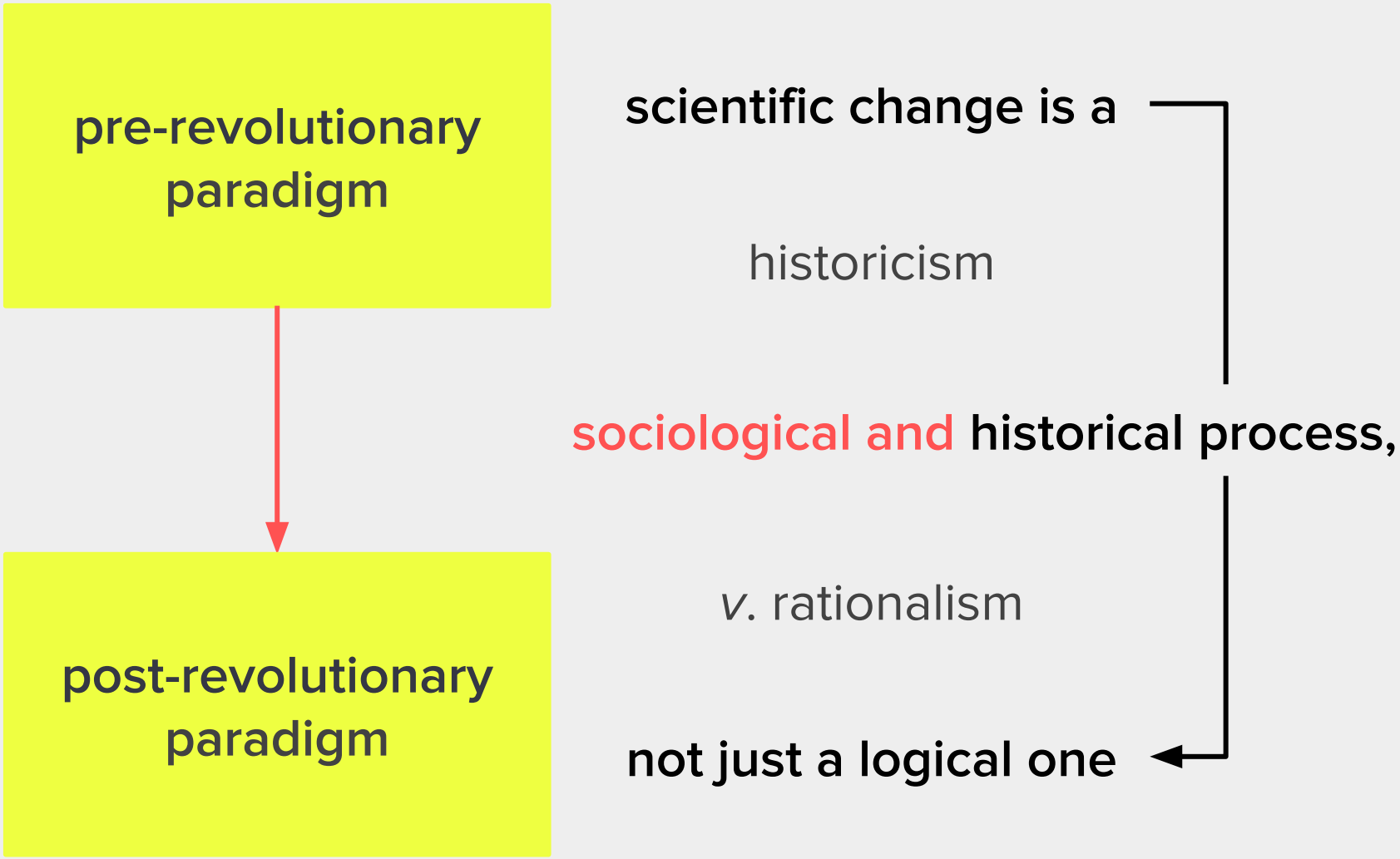
↑ Hence, the role of history in understanding science



Paradigmatic change



Paradigmatic change



Paradigms everywhere

Inflationary paradigm in trouble after Planck2013

we comment on problems reconciling inflation with a standard model Higgs, as suggested by recent LHC results. In sum, we find that recent experimental data disfavors all the best-motivated inflationary scenarios and introduces new, serious difficulties that cut to the core of the inflationary paradigm.

Towards a paradigm shift in biology

The steady conversion of new techniques into purchasable kits and the accumulation of nucleotide sequence data in the electronic data banks leads one practitioner to cry, "Molecular biology is dead — Long live molecular biology!".

Animal Consciousness: Paradigm Change in the Life Sciences

Paradigms everywhere

Policy Paradigms, Social Learning, and the State

The Case of Economic Policymaking in Britain

Peter A. Hall

This text is part of your **Public Policy** course readings

These policy paradigms are rather like the scientific paradigms that Thomas Kuhn has identified, and we can take advantage of this analogy to develop some hypotheses about how the learning process in public policymaking might proceed.[24] For instance, reference to Kuhn allows us to locate the different kinds of policy change relative to one another. First and second order change can be seen as cases of "normal policymaking," namely of a process that adjusts policy without challenging the overall terms of a given policy paradigm, much like "normal science." Third order change, by contrast, is likely to reflect a very different process, marked by the radical changes in the overarching terms of policy discourse associated with a "paradigm shift."

Problems for consideration

- How do we reconcile **historicism** and **rationalism?**

  Popper [and followers] We don't.

  Lakatos [and others] Do we have a choice?

- **How many** scientific revolutions, and **when?**

  Physics Copernicus

  Chemistry Lavoisier

  Biology Darwin, Buffon

  Economics ?


QUESTIONS

Homework

Read **Bird** if you have not yet done so

Read **Schütz**

References

Kuhn, Thomas S. [1962] 2012. “Introduction: A Role for History,” in *The Structure of Scientific Revolutions*, 4th ed., Chicago, University of Chicago Press, pp. 1–9. **reader**

Bird, Alexander. 2008. “The Historical Turn in the Philosophy of Science”, in Psillos, Stathis and Curd, Martin (eds), *The Routledge Companion to the Philosophy of Science*, London, Routledge, pp. 67–77. **reader**

Extra readings are available on Google Drive and are not compulsory

Tutorial 5 in Epistemology and Philosophy of the Social Sciences

François Briatte

Fall 2018

Reading 7

Bird

THE HISTORICAL TURN IN THE PHILOSOPHY OF SCIENCE

1 Developments in the History of Science

The history of science has a long history. Aristotle's scientific works are prefaced by historical account of those sciences, and this model persisted through medieval times until and including the rise of modern science in the era of the scientific revolution. Joseph Priestley, for example, entitled two of his books of pioneering research *The History and Present State of Electricity* and *The History and Present State of Discoveries Relating to Vision, Light, and Colours*. For many such early modern authors the history of science serves as a propaedeutic. William Whewell's *A History of the Inductive Sciences* (1857) is regarded as the first genuinely modern work of the history of science. Even so, Whewell's scholarship has an extra-historical purpose, which was to furnish the materials against which a satisfactory philosophy of science could be constructed. While Whewell rejected a Leibnizian logic of discovery, he did nonetheless believe that general principles of scientific inference could be uncovered by careful consideration of the history of scientific research. Whewell's approach was followed by several early positivists, notably, Mach, Ostwald, and Duhem.

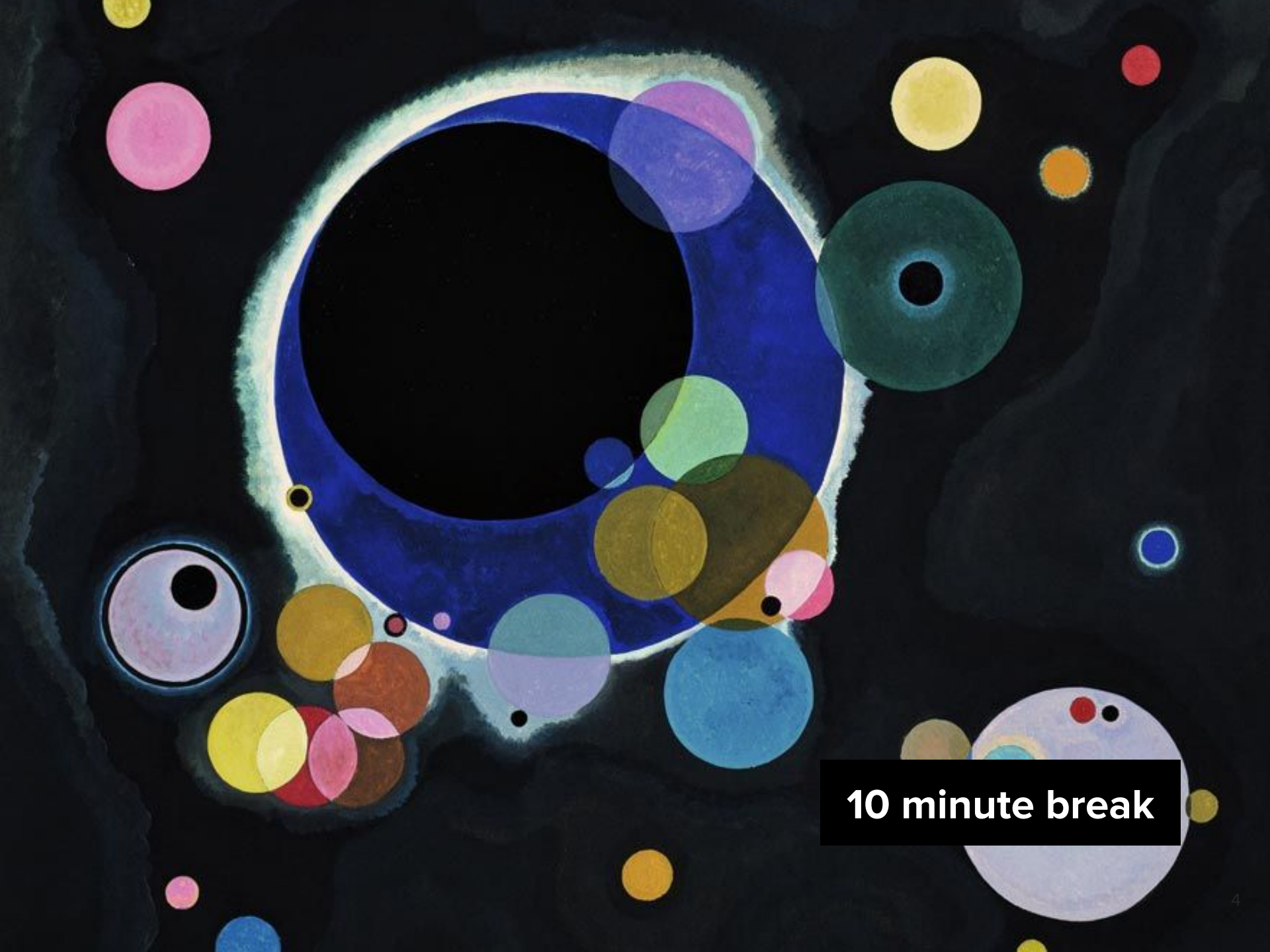
Nonetheless, as positivism developed philosophically it also became more ahistorical. Carnap's programme of *a priori* inductive logic was premised on a distinction between a context of discovery and a context of justification. The former concerned the process of coming up with an hypothesis, whereas the latter concerns its justification relative to the evidence. The former would be the province of psychology, although it may depend so much on details of individual biography that few general principles may be derived even *a posteriori*. Justification, however, is a matter of an *a priori* extension of the deductive logic of which Whewell had such a low opinion. Being *a priori* there was little room for the validation of inductive logic by historical examples. Rather, the conformity of historical episodes to a fully developed inductive logic would be a criterion of those episodes being genuine advances in knowledge rather than historical accidents—just as genuine mathematical knowledge must conform to the new logic of Frege, Peano, Russell, and Whitehead. Consequently, the middle period of the twentieth century (from the late 1920s to the early 1960s) was one in which the philosophy of science proceeded with little influence from or notice of the history of science.

Thus history and philosophy of science took separate paths during the years before and after the Second World War. History of science nonetheless continued to be influenced, initially at least, by broadly positivist inclinations. A crucial impetus was

Writing workshop

Summarise the views of [1] Kuhn, [2] Lakatos and [3] Feyerabend.

[4] In your view, which of the authors do scientists agree most often with?


10 minute break

Reading 8

Schütz

VOLUME LI, No. 9 APRIL 29, 1954

THE JOURNAL OF PHILOSOPHY

CONCEPT AND THEORY FORMATION IN THE SOCIAL SCIENCES [1]

THE title of my paper refers intentionally to that of a Symposium held in December, 1952, at the annual meeting of the American Philosophical Association.[2] Ernest Nagel and Carl G. Hempel contributed highly stimulating comments on the problem involved, formulated in the careful and lucid way so characteristic of these scholars. Their topic is a controversy which for more than half a century has split not only logicians and methodologists but also social scientists into two schools of thought. One of these holds that the methods of the natural sciences which have brought about such magnificent results are the only scientific ones and that they alone, therefore, have to be applied in their entirety to the study of human affairs. Failure to do so, it has been maintained, prevented the social sciences from developing systems of explanatory theory comparable in precision to those offered by the natural sciences and makes debatable the empirical work of theories developed in restricted domains such as economics.

The other school of thought feels that there is a basic difference in the structure of the social world and the world of nature. This feeling led to the other extreme, namely the conclusion that the methods of the social sciences are *toto coelo* different from those of the natural sciences. In order to support this position a variety of arguments was proffered. It has been maintained that the social sciences are idiographic, characterized by individualizing conceptualization and seeking singular assertory propositions, whereas the natural sciences are nomothetic, characterized by generalizing conceptualization and seeking general apodictic propositions. The latter have to deal with constant relations of magnitude which can be measured and can perform experiments, whereas neither measurement nor experiment is practicable in the social sciences. In general, it is held that the natural sciences have to deal with material objects and processes, the social sciences, how-

[1] Paper presented at the 33rd Semi-Annual Meeting of the Conference on Methods in Philosophy and the Sciences, New York, May 3, 1953.

[2] Published in the volume *Science, Language and Human Rights* (American Philosophical Association, Eastern Division, Vol. I), Philadelphia, University of Pennsylvania Press, 1952, pp. 43–86 (referred to as SLH).

Reality as two worlds (p. 257)

Physical reality	**Social** reality
Material world (matter)	Mental world (psyche)
Physical elements	Human agents
… *Respond to stimuli*	… *Respond to other agents*
Functions	Intentions
Unicity of science	**Social sciences**
Nomothetic method	Idiographic method
⇒ **Apodictic generalization**	⇒ **Singular assertions**

Schütz · Inspirations and relevance / 1

- **Phenomenological approach** grounded in Husserl's concept of the *Lebenswelt* ('life world')

  ⇔ **Metaphysics** · **Psychology** · **Psychoanalysis**

- Inspired **interpretative** studies of 'everyday life' in society, in line with Weber's *Verstehende Soziologie*
  - **Methodological individualism** (≠ Durkheim, Parsons)
  - Social behaviour has its own distinct **meaningfulness**
  - Social actors share **intersubjective** knowledge

Schütz · Inspirations and relevance / 2

- Also influenced
  - **Constructivism**, i.e. the study of how reality is socially represented (Berger and Luckmann)
  - **Ethnomethodology**, i.e. formalizations of everyday interactions (Garfinkel)
- **Daily social life** is now routinely understood as crucial to sociological processes (Bourdieu, Giddens, Luhmann...)

Meaningful social action

- **Schemes of experience**
  - **‘In order to’ motives** (forward-looking)
  - **‘Because of’ motives** (backward-looking)
- Sharing mechanism: **communication**
  (i.e. interaction between two subjects)
  - **Ego** provides ‘in order to’ motives
  - **Alter ego** stores them as ‘because of’ motives

⇒ Result: **intersubjectivity** (i.e. shared understandings)

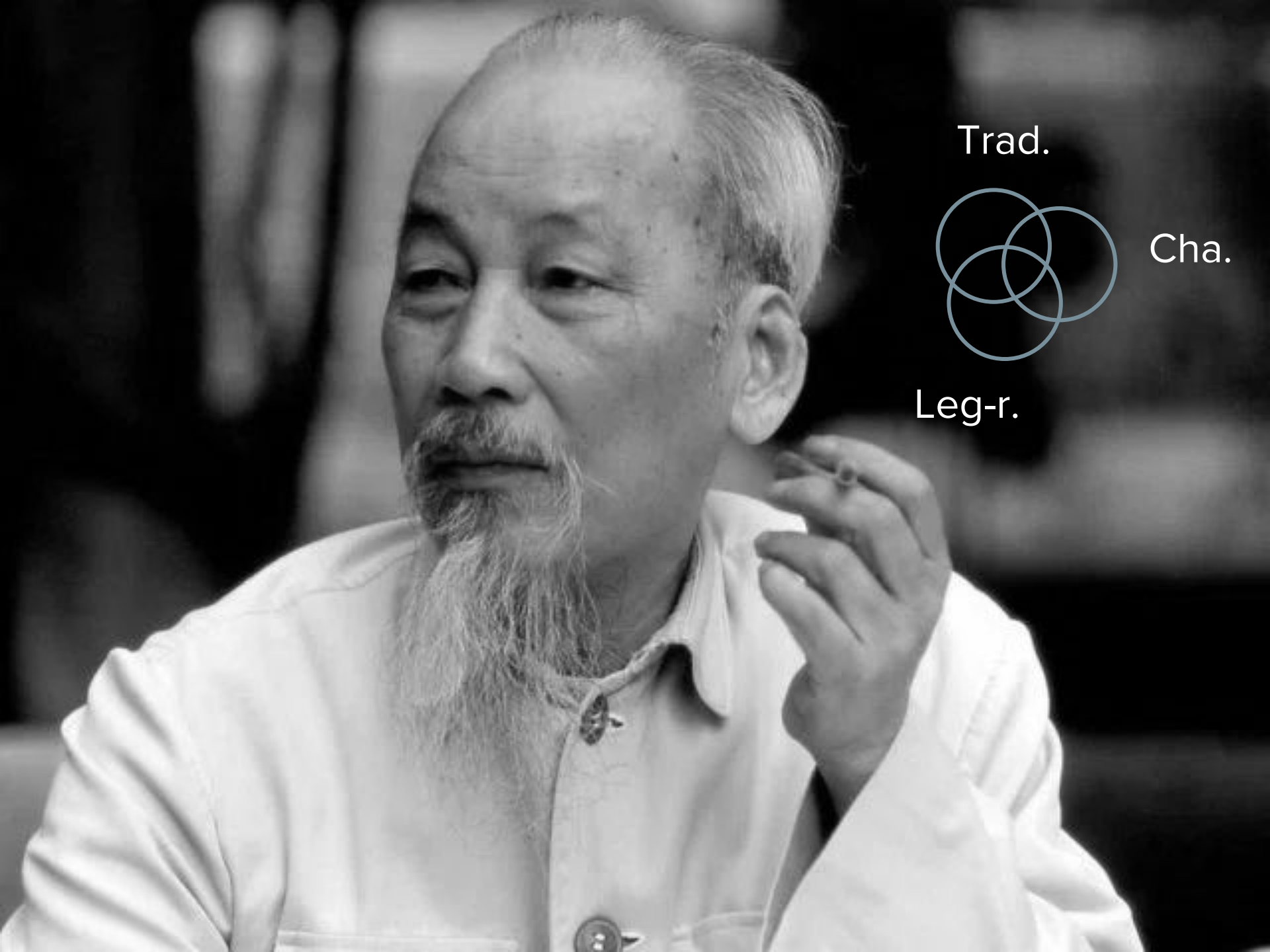
Interpretive social science

- Theory formation via **ideal-types**
  - Shared understandings that are **taken for granted**
  - Separable in theory, **mixed together in practice**
- Empirical basis: **common-sense knowledge** (p. 268-9)

  ⇔ **Mental constructs** shared in everyday life

  ⇔ **‘First-degree’ understanding** (second: ideal-types)
- Classical ideal-type example: **modes of domination**

  Traditional · Charismatic · Legal-rational


Trad.
Cha.
Leg-r.

Disagreements about Weber (p. 259)

- **Motives for action** are amenable to observation

⇒ Can we really study things that are *immanent*?

- **Emotions** and psychological states determine action
- **Social values** can be studied in a neutral fashion

⇔ **Value-neutral sociology**


QUESTIONS

Bonus digression: Immanuel Kant / 1

"Kant's whole ethics amounts to the idea that every person, in every action, must reflect on **whether the maxim of his action can become a general law.**"

(Hannah Arendt, interview with Joachim Fest, 1964)

⇒ Were Popper and the Vienna Circle **neo-Kantians?**

Possibly. Yet, ...

Bonus digression: Immanuel Kant / 2

… yet Kant's *Critique of Judgment* insists that we "**think from the standpoint of everyone else**"

[… which is why Arendt mentions Kant to Fest in the previous quote: she is discussing Adolf Eichmann's lack of empathy.]

⇒ From that viewpoint, **Schütz** is the true neo-Kantian here.

Homework

Read Canguilhem

… in English or in French — the French version is available from the ‘Extra readings (Tutorials)’ folder on Google Drive

References

Bird, Alexander. 2008. “The Historical Turn in the Philosophy of Science”, in Psillos, Stathis and Curd, Martin (eds), *The Routledge Companion to the Philosophy of Science*, London, Routledge, pp. 67–77. **reader**

Fest, Joachim. 1964. *Hannah Arendt. The Last Interview*. New York, Melville House.

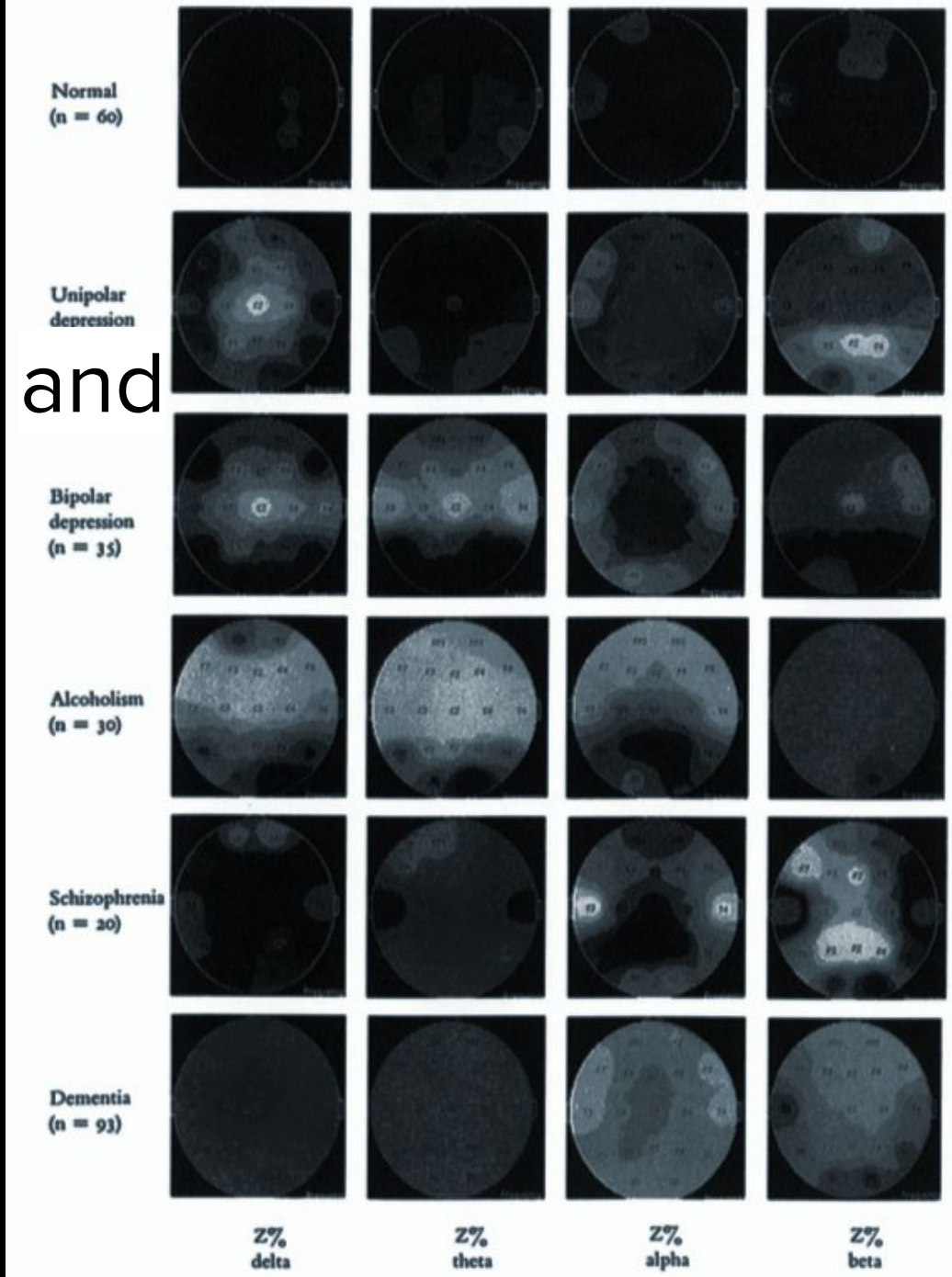
Schütz, Alfred. 1954. “Concept and Theory Formation in the Social Sciences,” *Journal of Philosophy* 51 (9): 257–73. **reader**

Extra readings are available on Google Drive and are not compulsory

Tutorial 6 in Epistemology and Philosophy of the Social Sciences

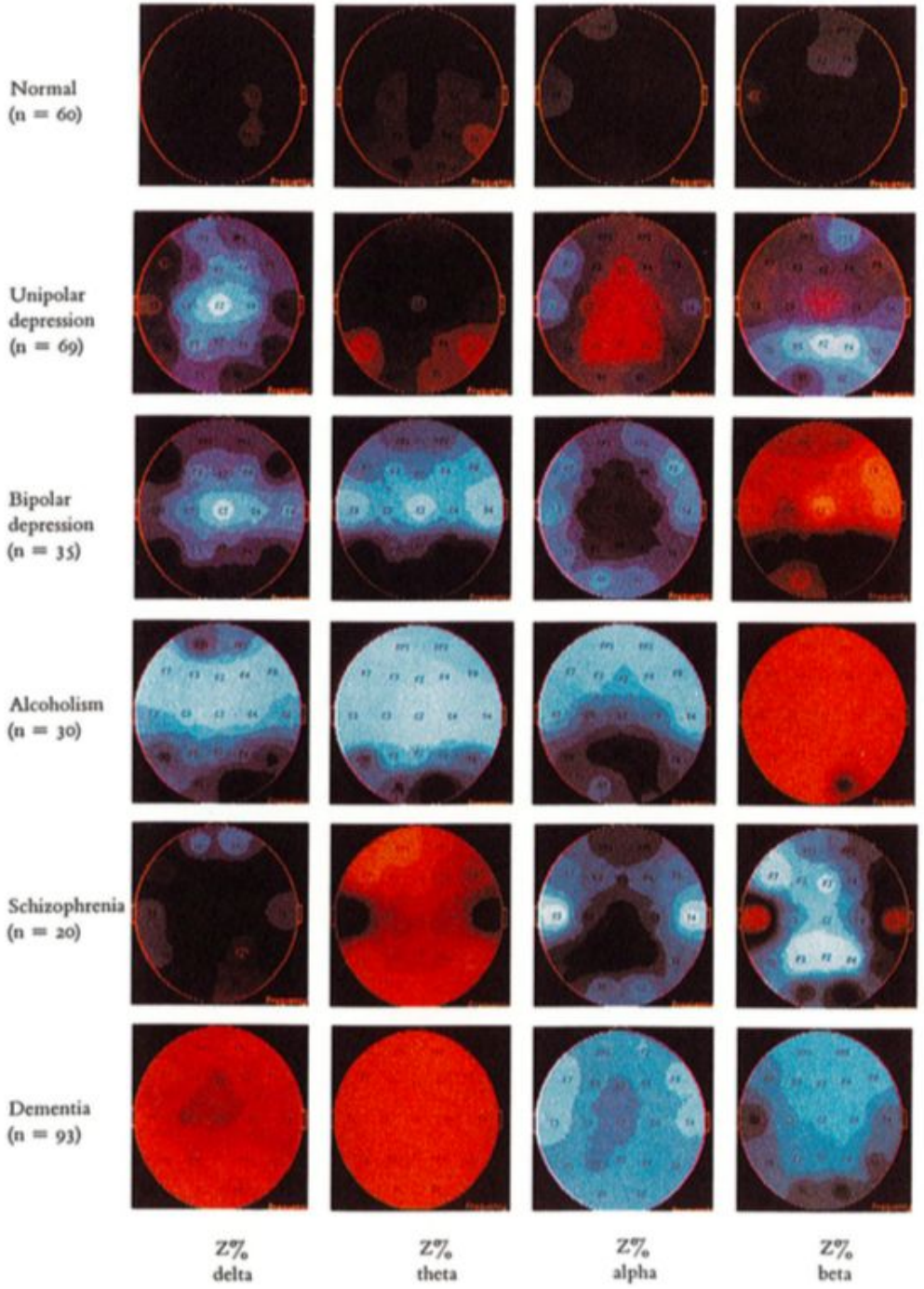
François Briatte

Fall 2018



[3] E. R. John, L. S. Prichep, J. Fridman, and P. Easton, "Neurometrics: Computer-Assisted Differential Diagnosis of Brain Dysfunctions," *Science*, 239 (January 8, 1988), 162-169. The authors conclude: "Healthy persons display only chance deviations beyond the predicted ranges. . . . Patients with neurological impairments, subtle cognitive dysfunctions, or psychiatric disorders show a high incidence of abnormal values. The magnitude of the deviations increases with clinical severity. Different disorders are characterized by distinctive profiles of abnormal brain electrical features. . . . These methods may provide independent criteria for diagnostic validity, evaluations of treatment efficacy, and more individualized therapy."

Tufte 1990:78



Reading 8

Canguilhem

Georges Canguilhem

Le normal
et le pathologique

QUADRIGE/PUF

tions d'activité, à un genre collectif et même individuel de vie et dont la relativité traduit, par un réflexe conditionné à déclenchement variable, des normes du comportement humain. La volonté humaine et la technique humaine peuvent faire de la nuit le jour non seulement dans le milieu où l'activité humaine se développe, mais dans l'organisme même dont l'activité affronte le milieu. Nous ne savons pas dans quelle mesure d'autres constantes physiologiques pourraient, à l'analyse, se présenter de la même manière comme l'effet d'une souple adaptation du comportement humain. Ce qui nous importe c'est moins d'apporter une solution provisoire que de montrer qu'un problème mérite d'être posé. En tout cas, dans cet exemple, nous pensons employer avec propriété le terme de comportement. Du moment que le réflexe conditionné met en jeu l'activité du cortex cérébral, le terme de réflexe ne doit pas être pris au sens strict. Il s'agit d'un phénomène fonctionnel global et non pas segmentaire.

* * *

En résumé, nous pensons qu'il faut tenir les concepts de norme et de moyenne pour deux concepts différents dont il nous paraît vain de tenter la réduction à l'unité par annulation de l'originalité du premier. Il nous semble que la physiologie a mieux à faire que de chercher à définir objectivement le normal, c'est de reconnaître l'originale normativité de la vie. Le rôle véritable de la physiologie, suffisamment important et difficile, consisterait alors à déterminer exactement le contenu des normes dans lesquelles la vie a réussi à se stabiliser, sans préjuger de la possibilité ou de l'impossibilité d'une correction éventuelle de ces normes. Bichat disait que l'animal est habitant du monde alors que le végétal l'est seulement du lieu qui le vit naître. Cette pensée est plus vraie encore de l'homme que de l'animal. L'homme a réussi à vivre sous tous les climats, il est le seul animal — à l'exception peut-être des araignées — dont l'aire d'expansion soit aux dimensions de la terre. Mais surtout, il est cet animal qui, par la technique, réussit à varier sur place même l'ambiance de son activité. Par là, l'homme se révèle actuellement comme la seule espèce capable de variation [114]. Est-il absurde de supposer que les organes naturels de l'homme puissent à la longue traduire l'influence des organes artificiels par lesquels il a multiplié et multiplie encore le pouvoir des premiers ? Nous n'ignorons pas que l'hérédité des caractères acquis apparaît à la plupart des biologistes comme un problème résolu par la négative. Nous

nous permettons de nous demander si la théorie de l'action du milieu sur le vivant ne serait pas à la veille de se relever d'un long discrédit (1). Il est vrai qu'on pourrait nous objecter qu'en ce cas les constantes biologiques exprimeraient l'effet sur le vivant des conditions extérieures d'existence et que nos suppositions sur la valeur normative des constantes seraient dépourvues de sens. Elles le seraient assurément si les caractères biologiques variables traduisaient le changement de milieu comme les variations de l'accélération due à la pesanteur sont en rapport avec la latitude. Mais nous répétons que les fonctions biologiques sont inintelligibles, telles que l'observation nous les découvre, si elles ne traduisent que les états d'une matière passive devant les changements du milieu. En fait, le milieu du vivant est aussi l'œuvre du vivant qui se soustrait ou s'offre électivement à certaines influences. De l'univers de tout vivant on peut dire ce que Reininger dit de l'univers de l'homme : « Unser Weltbild ist immer zugleich ein Wertbild » (1), notre image du monde est toujours aussi un tableau de valeurs.

(1) *Wertphilosophie und Ethik*, p. 29, 1939, Vienne-Leipzig, Braumuller.

Unser Weltbild
ist immer zugleich
ein Wertbild

— Reininger

available in French

(1) * Nous ne nous permettons plus de nous le demander aujourd'hui.

Bachelard and **Canguilhem** [and later, **Foucault**]

- **Gaston Bachelard**

  "Every particular science produces at each moment of its **history** its **own norms of truth**" (Lecourt 1975: 164)

  ⇔ **Historicism, historical epistemology**

- **Georges Canguilhem**

  The **normal/pathological** distinction, which is essential to medicine, relies on **both natural and social facts**

  ⇔ **Vitalism** · "recognition of the originality of the vital fact" (Canguilhem, cited in Lecourt 1975: 179)

Bernard and **positivist sociology**

- **Claude Bernard**

  Pathologies are detectable via **excess** or **deficiency**

  e.g. height, weight, respiratory rate, heart rate

- [**Comte,**] **Quételet, Durkheim, Halbwachs**

  Individuals exist at some distance from the **mean**

  e.g. average likelihood of suicidal behaviour

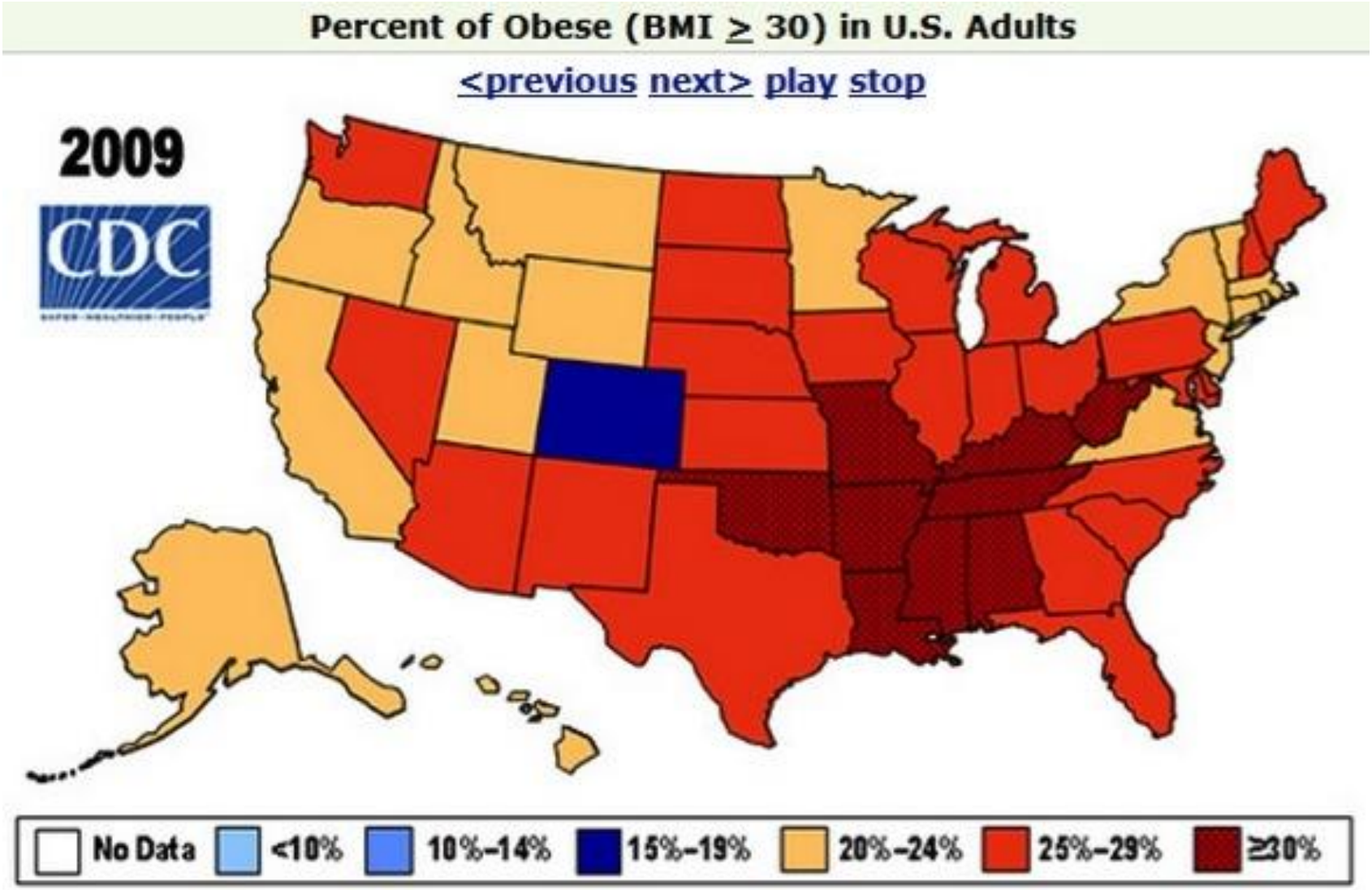
  ⇔ **objective knowledge** via
  measurement, **quantification** and **probabilities**

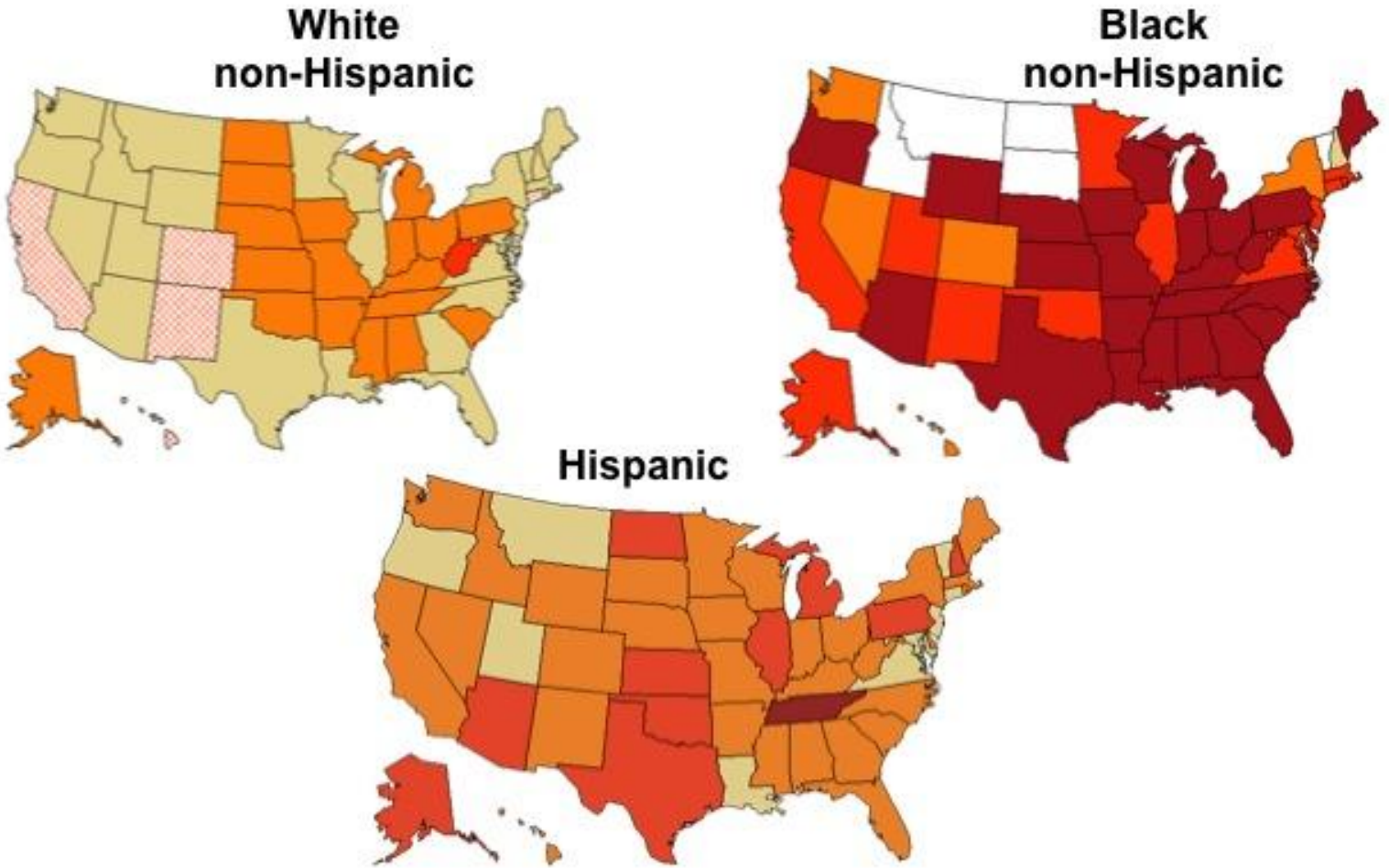
$$\text{Body Mass Index} = \frac{\text{mass (kg)}}{(\text{height(m)})^2} = \frac{\text{mass (lb)} \times 703}{(\text{height(in)})^2}$$

- For **normal weight** adults, $18.5 < \text{BMI} < 25$.
- For **overweight** adults, $25 \leq \text{BMI} < 30$.
- For **obese** adults, $\text{BMI} \geq 30$.

Data:

- National Health Interview Survey (NHIS)
- Sample: U.S. adult population, 2009


Percent of Obese (BMI ≥ 30) in U.S. Adults
<previous next> play stop
2009
CDC
No Data
<10%
10%–14%
15%–19%
20%–24%
25%–29%
≥30%


White
non-Hispanic
Black
non-Hispanic
Hispanic

Canguilhem's philosophy of medicine

- **Physiological constants** reflect **social norms** (standards)

  e.g. average life expectancy

  ⇔ social importance of long lifespans

  "Everything happens [as if] society had 'the mortality that suits it'" (p. 161)

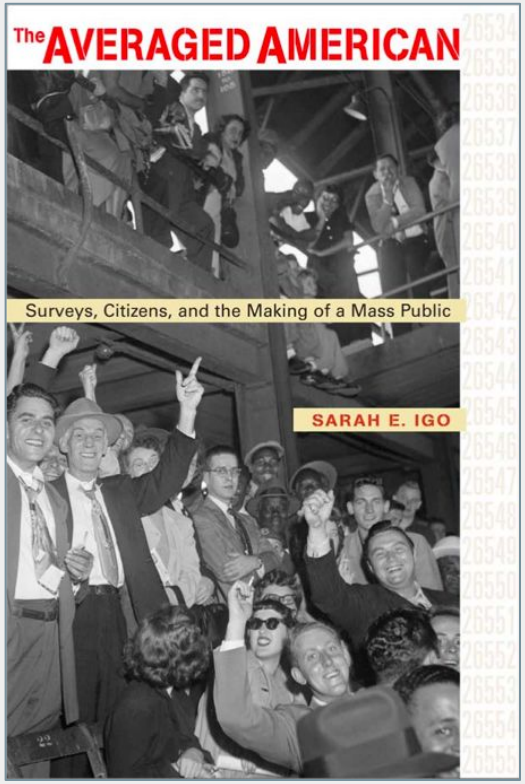
- **Averages have ontological meaning**

  e.g. average height (Quételet)

  ⇔ average ideological positions

⇔ **biological normativity** is partly social

⇔ constants are **'virtuous'**



Canguilhem's philosophy of society

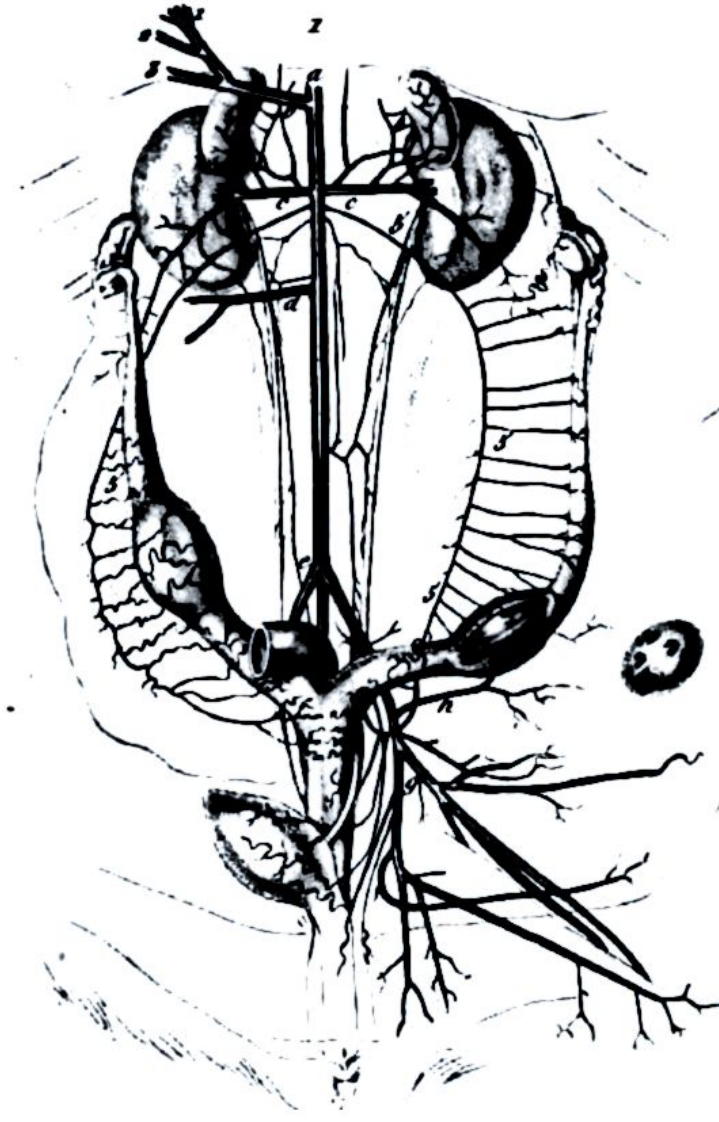
- **Social organisation** relies on **explicit norms** rather than implicit (or mechanistic) ones

  ≠ organicism

  ⇔ [Comte,] Durkheim

- **Norms exist via their violations: abnormality comes first**

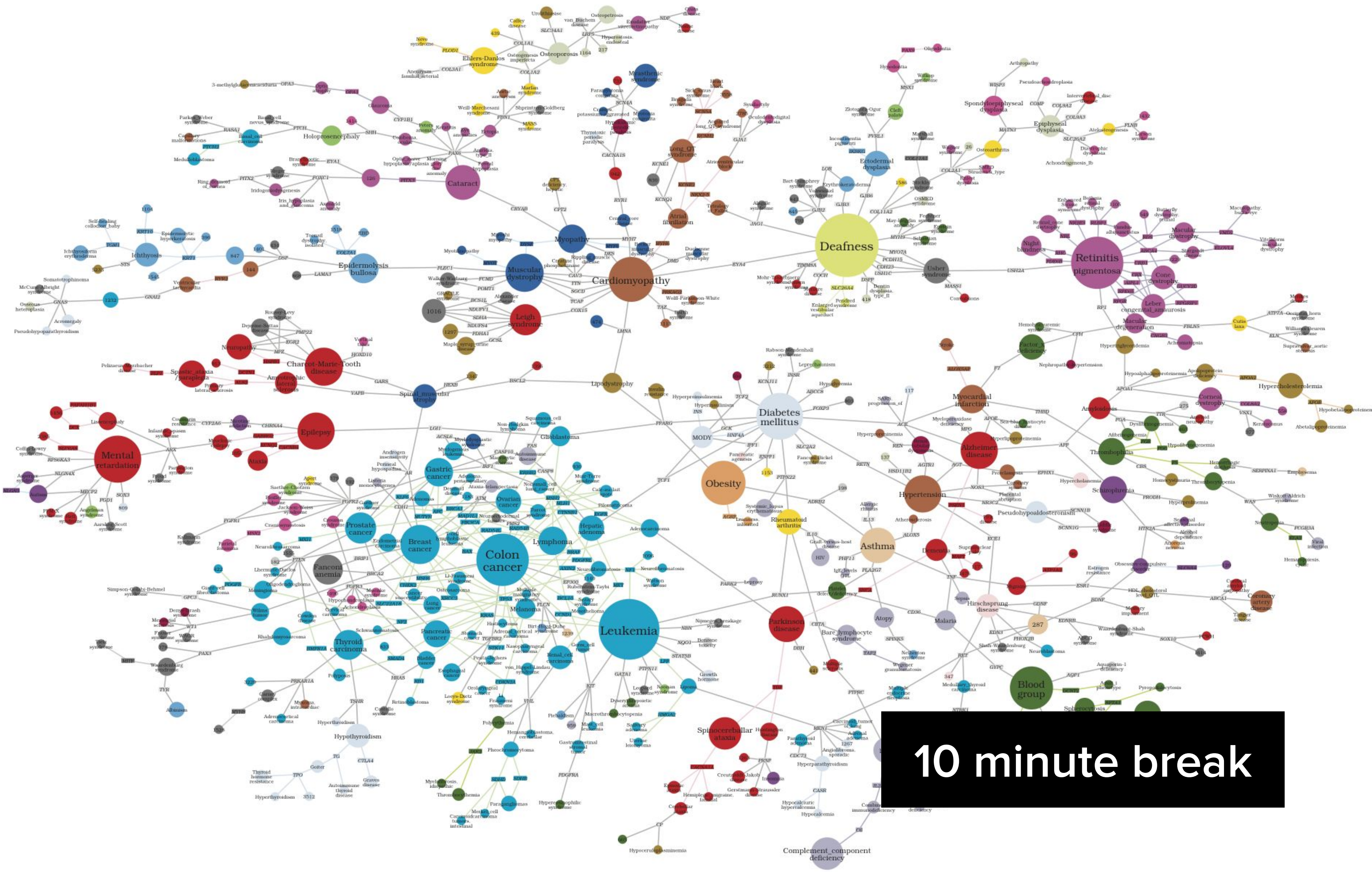
  e.g. linguistic normalisation, industrial standards, metric systems…




QUESTIONS

The human disease network

Goh K-I, Cusick ME, Valle D, Childs B, Vidal M, Barabási A-L (2007) *Proc Natl Acad Sci USA* 104:8685-8690



10 minute break

Writing workshop

[1] According to Canguilhem, what do we imply when we say that we feel ‘healthy’ or ‘well’? [2, 3] Illustrate.

[4] What does that tell us about the nature of medical knowledge?

Homework

Read Hacking

References

Bernard, Claude. 2008 [1947]. *Principes de médecine expérimentale*, Paris, Presses Universitaires de France.

Canguilhem, George. 1966. *Le normal et le pathologique*, Paris, Presses Universitaires de France. **reader** + French versions **extra**

Lecourt, Dominique. 1975. *Marxism and Epistemology. Bachelard, Canguilhem and Foucault*, London, NLB.

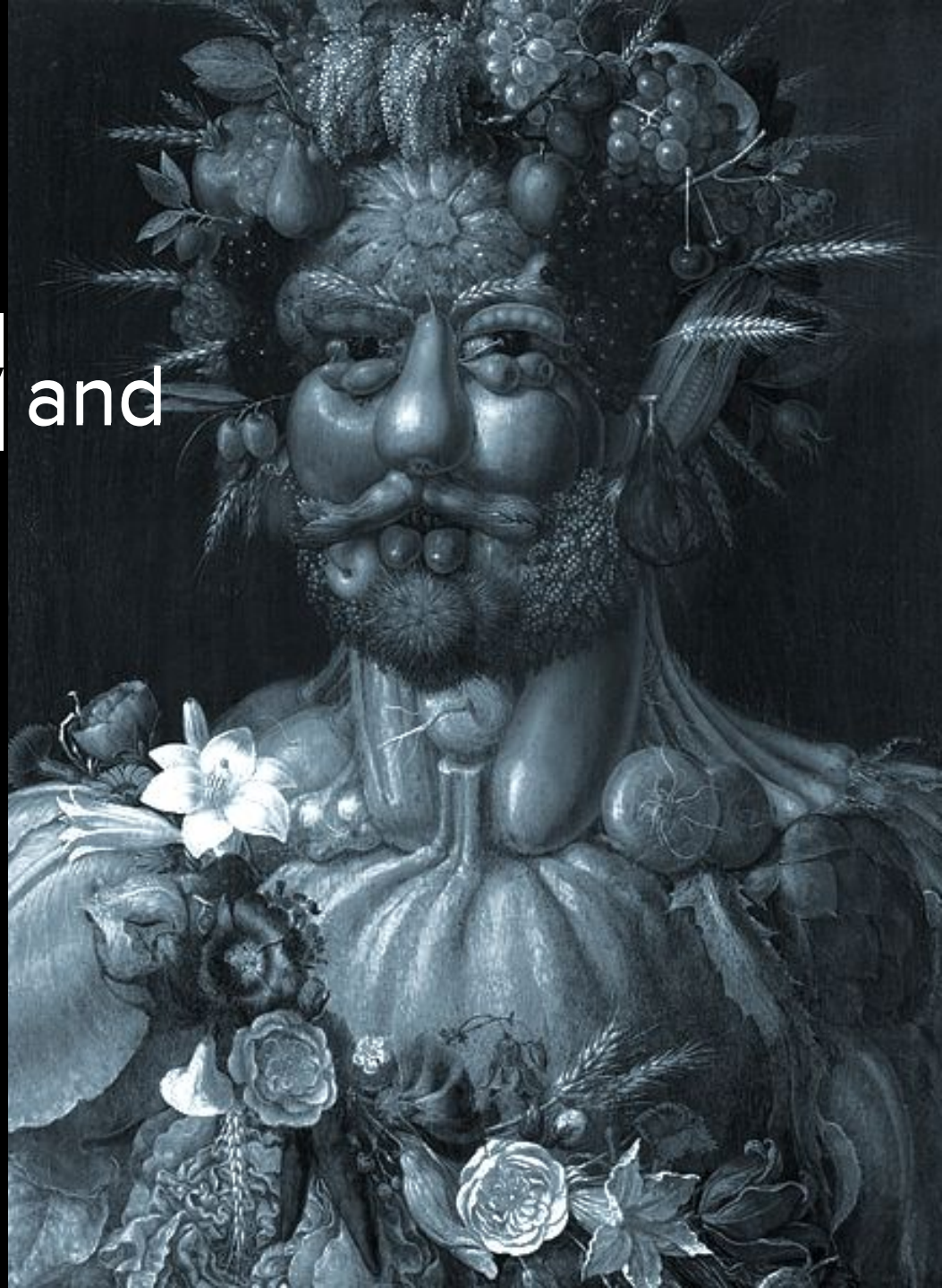
Tufte, Edward R. 1990. *Envisioning Information*. Cheshire, Graphics Press.

Extra readings are available on Google Drive and are not compulsory

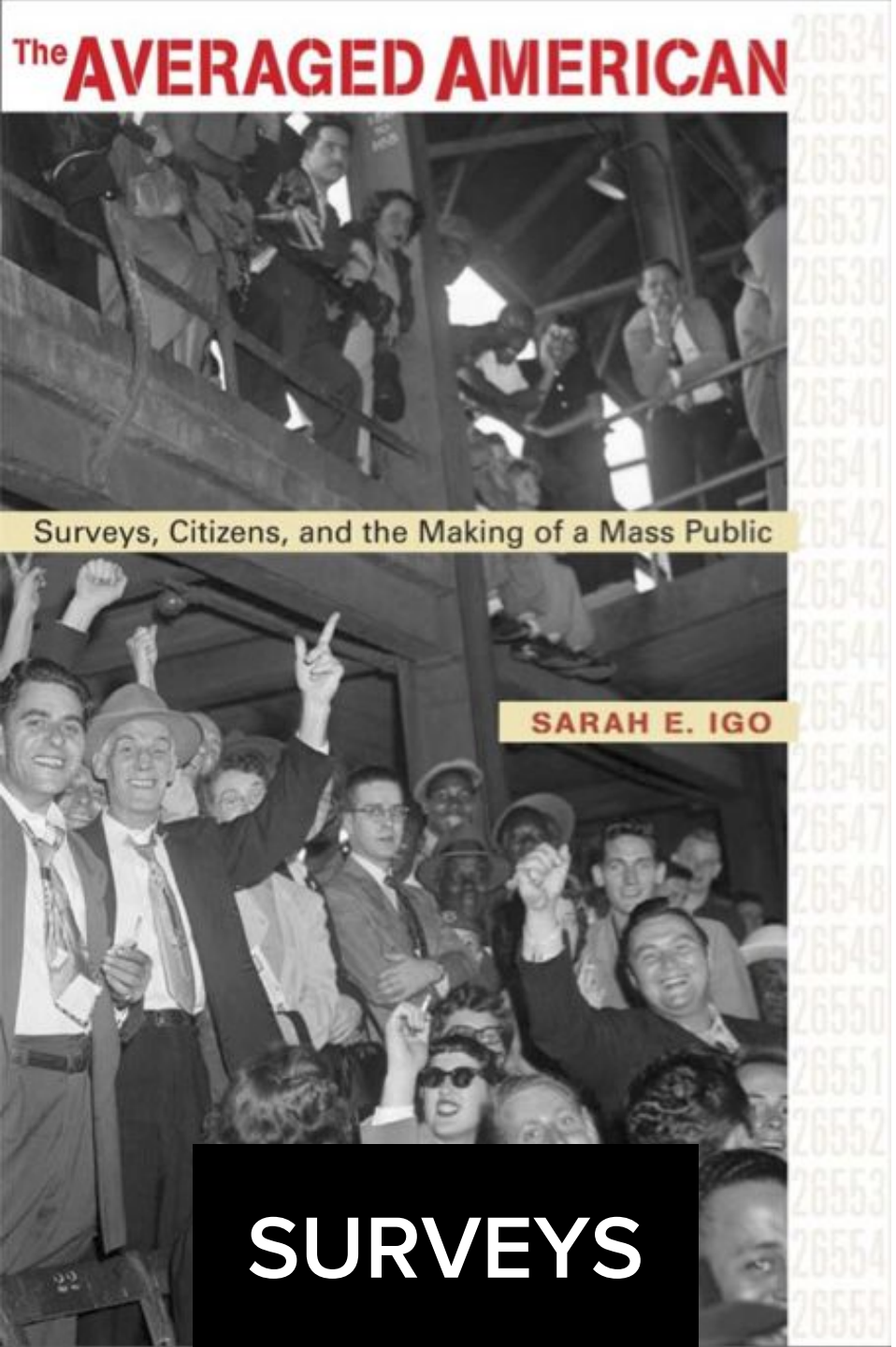
Tutorial 7 in Epistemology and Philosophy of the Social Sciences

François Briatte

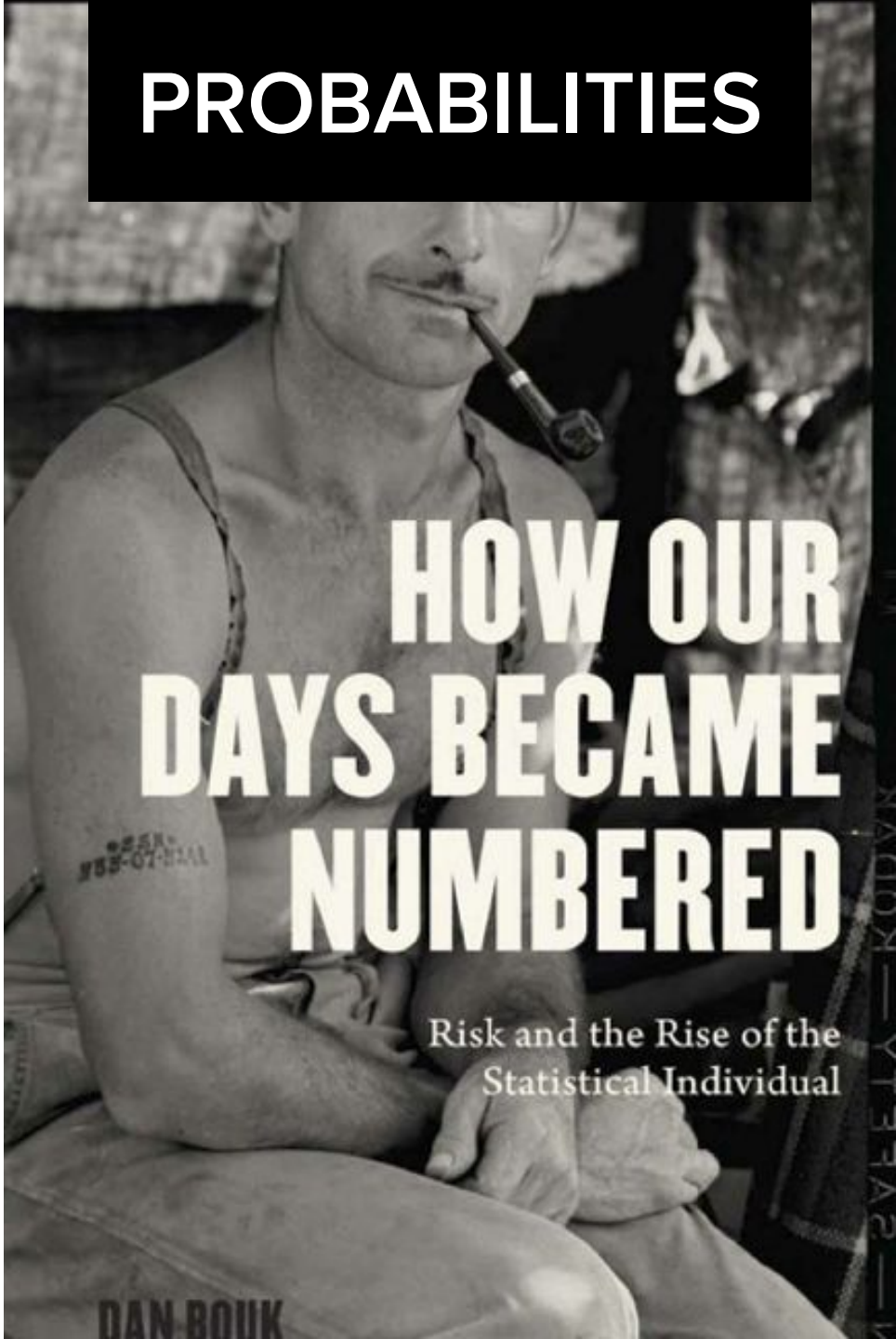
Fall 2018




CVCINA
WHAT ARE MADE OF?



SURVEYS



PROBABILITIES


MEASUREMENT


REGISTRATION

INSEE GROUPES ET CATEGORIES SOCIO-PROFESSIONNELLES

0. AGRICULTEURS

00 - agriculteurs
01 - propriétaires exploitants
02 - fermiers
03 - métayers

1. SALARIES AGRICOLES

10 - salariés agricoles

2. PATRONS DE L'INDUSTRIE ET DU COMMERCE

20
21 - Industriels
22 - artisans
23 - patrons pêcheurs
25 - commerçants
26 - gros commerçants
27 - petits commerçants

3. PROF. LIBERALES ET CADRES SUPERIEURS

5. EMPLOYES

51 - employés de bureau (secteur privé)
52 - employés de bureau (secteur public)
53 - employés de commerce

6. OUVRIERS

60 - contremaître (sect.privé)
61 - ouvriers qualifiés (sect. privé)
62 - ouvriers qualifiés et contremaîtres (sect.public)
63 - ouvriers spécialisés (secteur privé)
64 - ouvriers spécialisés

CLASSIFICATION

Notions to keep in mind

- **Epistemology**
  - ⇔ ‘how can we know’
  - ⇔ ‘what can we know’
- **Ontology**
  - ⇔ ‘what is the world made of’ e.g. genes, culture
  - ⇔ ‘what exists’ e.g. gods, numbers
- **Monism** v. **dualism**
- **Reductionism**

Reading 9

Hacking

12

The looping effects of human kinds

IAN HACKING

My topic is at some distance from others in this book. This is not because I am a philosopher given to abstraction and high generality. Many of my examples are all too reminiscent of sensationalist popular journalism. My causal understandings are complex and shady, my cognition is controversial applied knowledge, and my culture is our culture and none other.

Culture I am addressing not a human universal but ways of classifying that became possible only in industrial bureaucracies. Today their most salient features are the result of a recent democratization of some social sciences.

Cognition The classifications that I call human kinds make sense only within a peculiar conception of knowing and finding out.

Causality Human kinds are formulated in the hope of immediate or future interventions in the lives of individual human beings. If we change the background conditions we can improve the person, if only we can understand what kind of person we are dealing with. The causal understanding (or aspiration to understand) is practical.

None the less my theme is obsessively philosophical, for it is about self-reflection. It is about how a causal understanding, if known by those who are understood, can change their character, can change the kind of people that they are. That can lead to a change in the causal understanding itself. This chapter is about feedback effects in cognition and culture, and is a contribution to the study of what I call 'making up people' (Hacking 1986).

WHAT ARE HUMAN KINDS?

'Human kinds' is such an ugly turn of phrase that, as Auguste Comte said of *sociologie*, no one else would ever want to use it. I do not intend to pick out a definite and clearly bounded class of classifications. I mean to indicate kinds of people, their behaviour, their condition, kinds of action, kinds of

Natural v. human kinds

- **Nature** does not react to **classification**

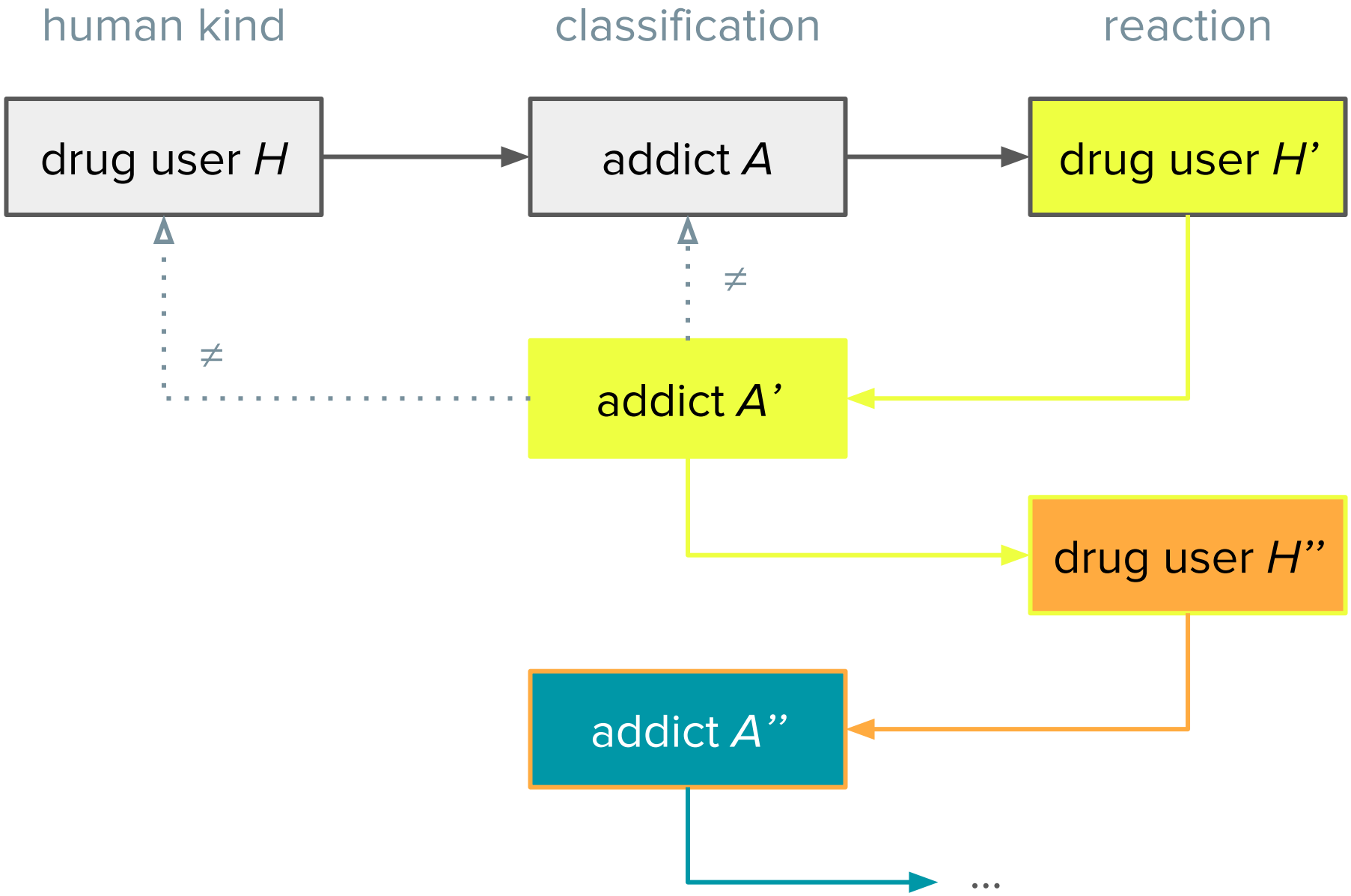
  N ⟶ scientific classification ⟶ ***N***

  ≠ **Society** does, via **moral assessment**

  H ⟶ scientific classification ⟷ ***H'*** · *modified H*

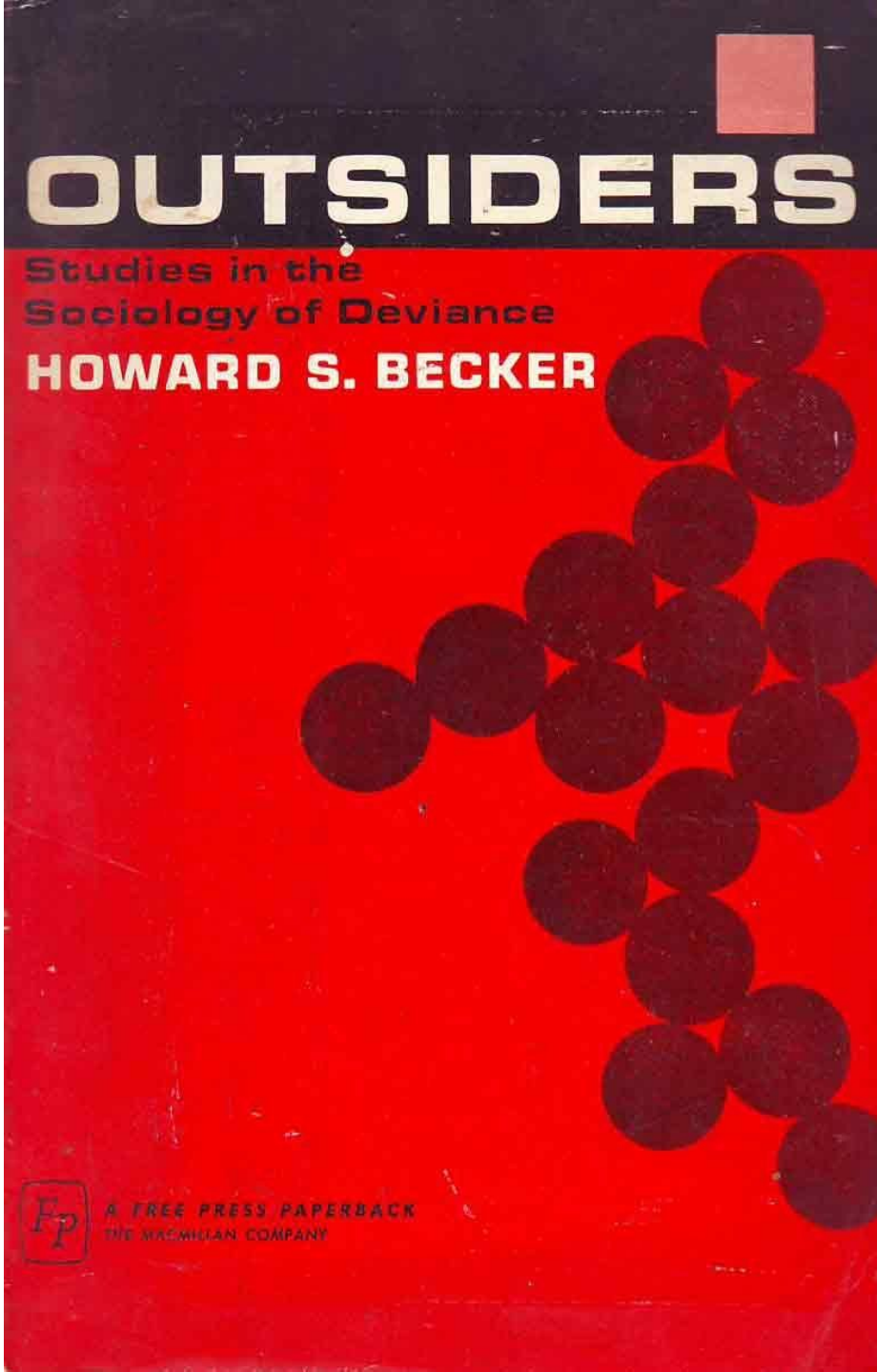
- **Human kinds react** to classification by
  - redefining their **identity**
  - altering their **behaviour**

    … rendering former classifications obsolete


human kind
classification
reaction
drug user H
addict A
drug user H'
≠
≠
addict A'
drug user H''
addict A''
...

Once a rule has come into existence, it must be applied to particular people before the abstract class of outsiders created by the rule can be peopled. Offenders must be discovered, identified, apprehended and convicted (or noted as "different" and stigmatized for their nonconformity, as in the case of legal deviant groups such as dance musicians). This job ordinarily falls to the lot of professional enforcers who, by enforcing already existing rules, create the particular deviants society views as outsiders.

It is an interesting fact that most scientific research and speculation on deviance concerns itself with the people who break rules rather than with those who make and enforce them. If we are to achieve a full understanding of deviant behavior, we must get these two possible foci of inquiry into balance. We must see deviance, and the outsiders who personify the abstract conception, as a consequence of a process of interaction between people, some of whom in the service of their own interests make and enforce rules which catch others who, in the service of their own interests, have committed acts which are labeled deviant.



… Hacking (1999, Ch. 5) distinguishes between ‘child abuse’ and ‘satanic ritual abuse’. Satanic ritual abuse is a socially constructed idea, but not a social kind.

Bird and Tobin 2017

… Hacking (1999, Ch. 5) distinguishes between ‘child abuse’ and ‘satanic ritual abuse’. Satanic ritual abuse is a socially constructed idea, but not a social kind. In the 1990s, there was an exhaustive investigation into **satanic ritual abuse** in Great Britain after a number of reported cases. However, an independent commission claimed that none of the charges were substantiated by evidence. Thus, our constructed categories are **subject to empirical investigation**.

Bird and Tobin 2017

… in contrast, a kind such as child abuse is considered real. The emergence of the category can be traced to a definite **time** (1961) at a definite **place** (Denver) in the discussions of paediatricians.

Bird and Tobin 2017

… in contrast, a kind such as child abuse is considered real. The emergence of the category can be traced to a definite **time** (1961) at a definite **place** (Denver) in the discussions of paediatricians. Moreover, the **reference** of the category was abused children. This reference **dynamically changed** as the idea became embedded in new legislation, incorporated in practices involving social workers, police, schoolteachers etc.

Bird and Tobin 2017

Notions to keep in mind

- **Conventionalism**

  strong v. weak

- **Constructivism**

  universal v. local

- **Realism**

  in philosophy ≠ in social science

- **Naturalism**


QUESTIONS

Homework

Read Latour and Woolgar

References

Becker, Howard S. 1963. “Moral Entrepreneurs”, in *Outsiders. Studies in the Sociology of Deviance*, New York, Free Press, pp. 147–64. **extra**

Hacking, Ian. 1995. “The Looping Effects on Human Kinds”, in Sperber, Dan, Premack, David and Premack, Anne J. (eds), *Causal Cognition. A Multidisciplinary Approach*, Clarendon Press, pp. 351–83. **reader**

Khalidi, Mohammad Ali. 2013. “Kinds (Natural Kinds vs. Human Kinds),” in B. Kaldis (ed.), *Encyclopedia of Philosophy and the Social Sciences*, Thousand Oaks, Sage. **extra**

Extra readings are available on Google Drive and are not compulsory

Tutorial 8 in Epistemology and Philosophy of the Social Sciences

François Briatte

Fall 2018

QUIZZES

AND

MIDTERM

GRADES

1. Relying as much as possible on specific examples, illustrate the **relevance** of Hume's "problem of induction" **for philosophy of science**

2. Popper argued against the foundationalist pretensions of neopositivist philosophers [...]. Spell out the **consequences** for the **social and political philosophy** of this conception of science

3. What are the main tenets of the **"standard picture"** of science that are overturned by Kuhn's ***historical*** philosophy of science?

Midterm questions: ‘Hume’s problem’

- **Causation** or the **problem of induction**
  - Inference of general laws from **repeated observation**
  - Problem: no logical foundation to **inductive inference**
  - **Deterministic** ≠ **probabilistic** reasoning (Russell)
- **Reactions** to Hume’s problem
  - **Vienna Circle:** acknowledgement without solution
  - **Popper:** different criterion of demarcation
  - *Also* · paradoxes of induction

Midterm questions: Popper's philosophy

- **Falsificationism**
  - Knowledge is antithetical to **absolute certainty**
  - **Corroboration** requires **collective scrutiny**
- **Social and political** consequences
  - **Criticism** is essential to intellectual progress
  - **Tolerance** for error and contradiction
  - *The Open Society* · defense of **liberalism**

    — *cf.* critical rationalism (Agassi, Boyer)

Midterm questions: Kuhn *v.* the 'standard picture'

- **Scientific progress** is neither **linear** or **accretive**
  - **Scientific paradigms** intersped by scientific **revolutions**
  - **Examples:** Copernicus, Darwin, Lavoisier, Einstein
- **Scientific observation** is **context-dependent**
  - History shapes *both* **discovery** and **justification**
  - **Scientific methods** will vary through time
- **Scientific change** results from **sociological processes**
  - ≠ **rationalist** explanations

Grading scheme (my own, not everyone's)

< 4 **Clearly insufficient**

- No answer beyond **descriptive** terms
- **Spelling** and other language issues (–1, –2)

4, 5 **Marginally (in)sufficient**

- **Weak examples** beyond chickens…
- **Tenses** and other language issues (–1, –2)

6+ **Reasonably (very) good**

None of the above, or just spelling (–1)

English language for native French speakers

- Do not use **oral contractions** (or expressions) in writing

  e.g. don’t, isn’t, it’s, etc.

- **Tenses**, especially the final ‘s’ on third-person singulars
- Beware of French **double consonants**

  e.g. ‘developped’ or ‘additionnally’

- **Cut the rhetoric:** eliminate ‘indeeds’ and ‘thens’

  if need be, use ‘therefore’ and ‘consequently’

- **Write less:** English writing is more concise


QUESTIONS


10 minute break

Reading 10

Latour and Woolgar

accepted, the initial premises are modified (through representation in a written or other retrospective account) to make the syllogism formally correct (Bloor, 1976).

Our point is that the kind of work done by scientists and frequently depicted as analogical reasoning is not reasoning. Spencer wanted to carry out a successful assay, he had bombesin in the laboratory and he wanted to make something out of it. He had accumulated data on the similarity of bombesin and neurotensin, he read Bis's paper, and he adopted the assay described by Bis. By reconstructing the material setting, circumstances, and chance encounters, it becomes clear that the decision to try out the effects of bombesin on temperature was a very small step, and far from the audacious logical leap which it was later depicted to be. Precisely because the local circumstances change very quickly, all reference to them disappears once the step has been made. Both participant and observer are soon left with a version of the event which has been eroded of all contingent circumstances. Retrospectively, the two entities (practices or statements) appear unrelated. Consequently, any link between them will appear "Outstanding."

We have argued that accounts of the emergence of a new finding (or statement of fact) entail a two-fold process of transformation. On the one hand, the analogical path is often replaced by a logical connection. On the other hand, the complex set of local circumstances which temporarily makes possible a weak link gives way to flashes of intuition. The notion of someone having had an idea provides a highly condensed summary of a complex series of processes. It also forms the basis for an account which begins to come to terms with the essential contradiction between the use by scientists of procedures which are logical (but sterile) and yet fruitful (but logically incorrect). Our argument is not simply that thought processes are readily amenable to sociological study; rather, an important focus of study should be the aspects of scientists' accounting practices through which thought processes are created and sustained.

Facts and Artefacts

The paradox associated with the term fact was spelled out in Chapter 2: fact can have two contradictory meanings. On the one hand, our quasi-anthropological perspective stresses its etymological significance: a fact is derived from the root *facere, factum* (to make or to do). On the other hand, fact is taken to refer to some objectively

while the latter merely arises from local circumstances and psychological conditions. The distinction between reality and local circumstances *exists only after* the statement has stabilised as a fact.

To summarize the argument in another way, "reality" cannot be used to explain why a statement becomes a fact, since it is only after it has become a fact that the effect of reality is obtained. This is the case whether the reality effect is cast in terms of "objectivity" or "out thereness." It is *because* the controversy settles, that a statement splits into an entity and a statement about an entity; such a split never precedes the resolution of controversy. Of course, this will appear trivial to a scientist working on a controversial statement. After all, he does not wait in hope that TRF will pop up at a meeting and finally settle the controversy as to which amino acids it comprises. In this work, therefore, we use the argument as a methodological precaution. Like scientists themselves we do not use the notion of reality to account for the stabilisation of a statement (see Ch. 3), because this reality is formed as a consequence of this stabilisation.[18]

Science as knowledge production

- **Realism** has 1. **objects** followed by 2. **statements**

  ≠ **Constructivism** has *no separation* between both

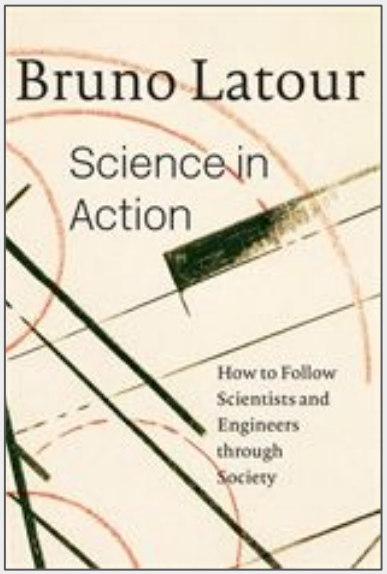
  and *strong* constructivism (à la Latour)

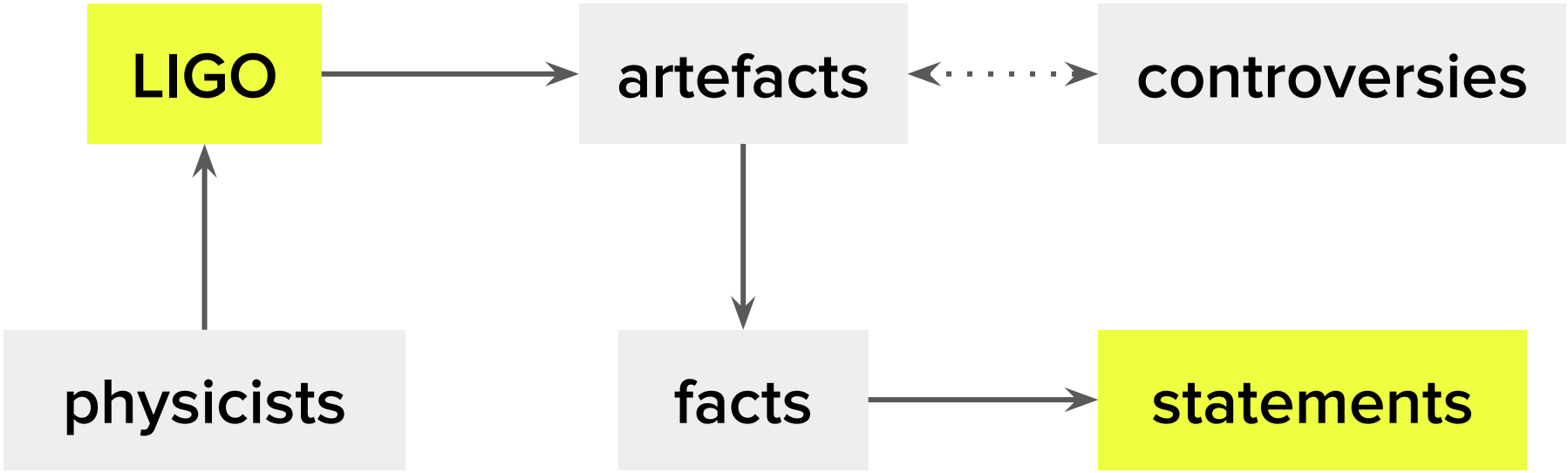
  - denies context-independent observability
  - allows statements to *create* objects from **artifacts**
- **Context** – i.e. scientific production – serves to
  - **negotiate** facts into objects
  - **stabilize** objects into **persuasive devices**

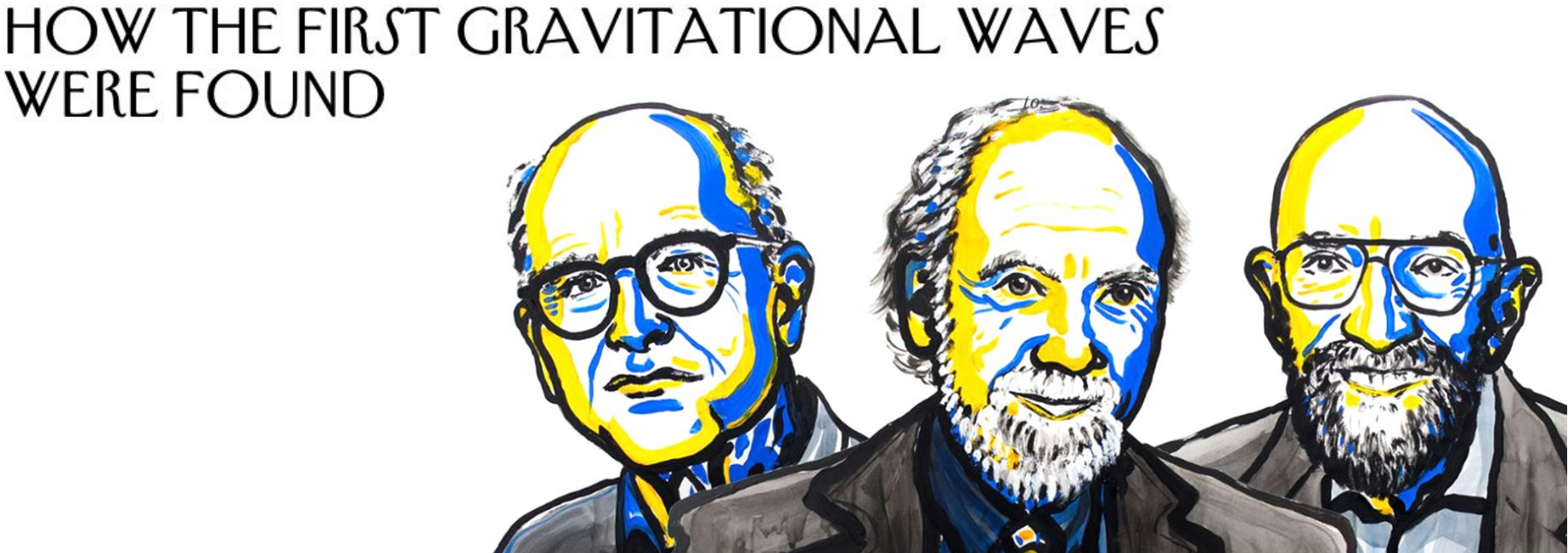
Science as a bargaining process

- **Scientific statements** result not from their **truth value**, but
  - from ‘solving’ (closing) **controversies**
  - extending **scientific context** to other environments
- As a consequence, **understanding science** is about
  - observing **science in practice**

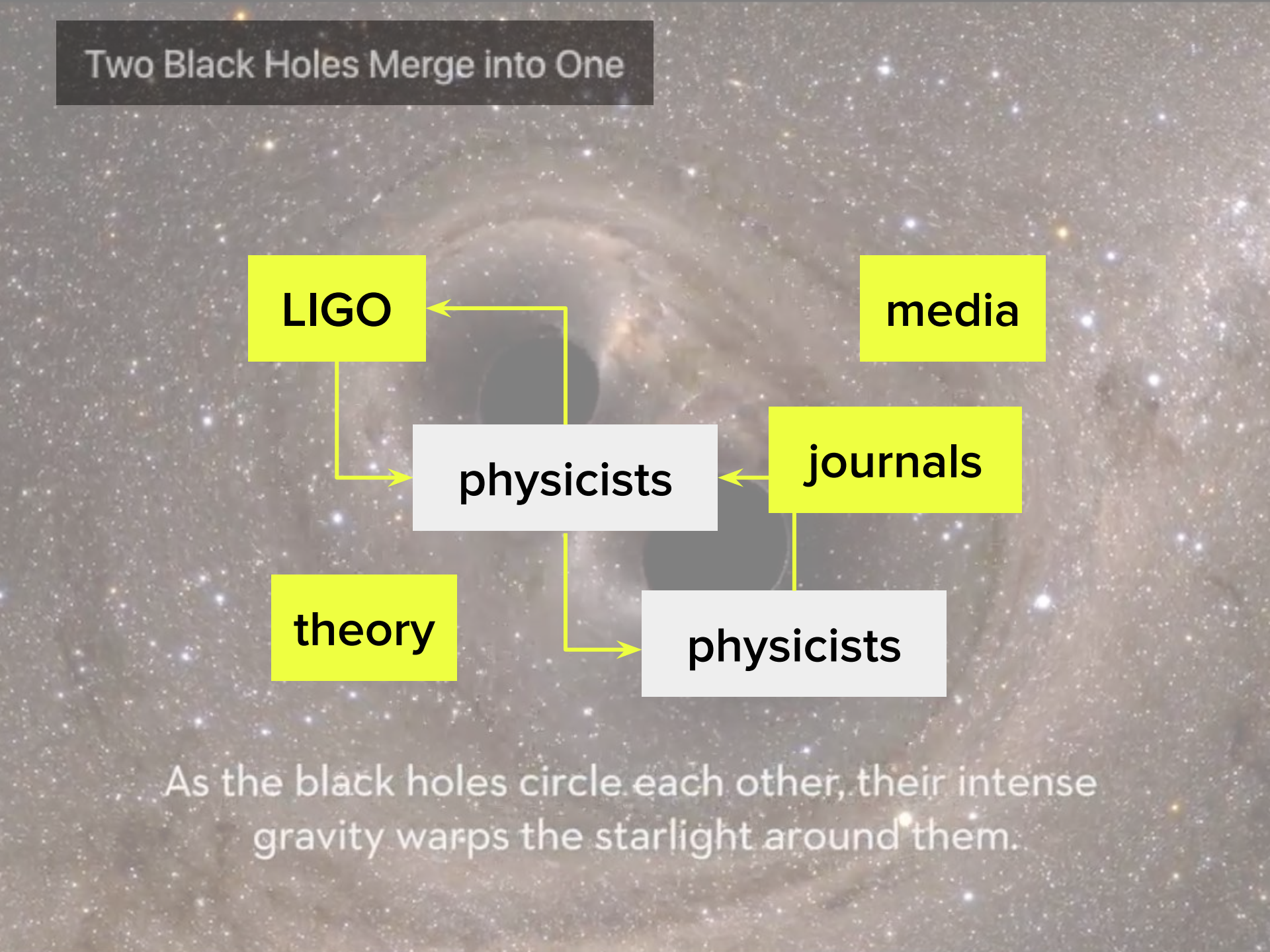
    within its ‘black boxes’
  - showing how **scientists win arguments**
  - studying **technoscience** objects




LIGO
artefacts
controversies
physicists
facts
statements


HOW THE FIRST GRAVITATIONAL WAVES WERE FOUND


Two Black Holes Merge into One
As the black holes circle each other, their intense gravity warps the starlight around them.


Two Black Holes Merge into One
LIGO
media
physicists
journals
theory
physicists
As the black holes circle each other, their intense gravity warps the starlight around them.

Where do we go from there?

- **Historical** studies of science

  showing the crucial influence of e.g. war, capitalism

- **Philosophical** studies of science

  treating technology (‘golems’) on a par with scientists

- **Sociological** studies of science

  going ‘beyond Kuhn’ in sociologizing scientific output

See · Callon and Latour’s **Actor-Network Theory** (ANT)

Where do we go next in the study of science?

- **Philosophy of Science**
- **History** and Philosophy of Science (HPS)
- **Social Studies** of Science (SSS, 4S)
- **Science and Technology Studies** (STS)
- Sociology of Scientific Knowledge (SSK)
- Technoscience
- Social Epistemology
- Metascience

OVERALL REVIEW

AND APPLICATIONS

People, notions and their scope

Schütz
Kuhn
Russell
Neurath
Hempel
Hacking
Canguilhem
Popper

Nature ≠ Social world
Physicalism
Ideal types
The social influence on physiology
Norms ≠ Averages
Normal science
Organisms ≠ Society ≠ Machines
Logical empiricism
Paradigms
The looping effect on human kinds
Revolutionary science
Hypothetico-deductivism
Scientific objects
Explanation sketches
Falsificationism
The nature of science
Context of discovery/justification
How to study science
Historicizing epistemology
Induction

from Thomas'

slides

Application: genetically modified organisms

Les OGMs sont-ils nocifs ? (non) - DBY #27

653,147 views

30K 1.2K SHARE

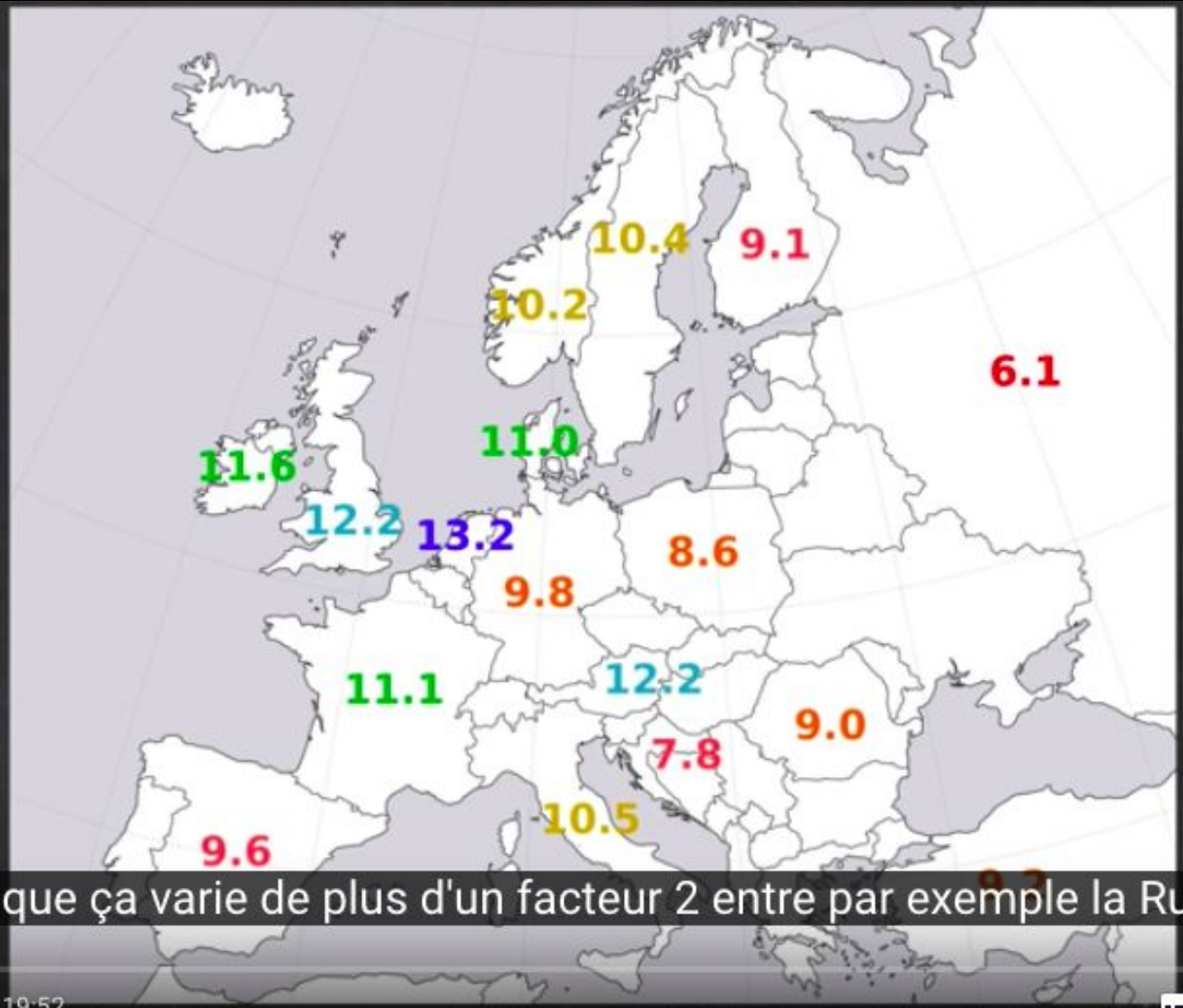
Application: genetically modified organisms

Les OGMs sont-ils nocifs ? (non) - DBY #27

653,147 views

30K 1.2K SHARE

Application: left-handedness



et on voit que ça varie de plus d'un facteur 2 entre par exemple la Russie à 6%

0:44 / 19:52

D'après MCMANUS, Ian Christopher. The history and geography of human handedness. Language lateralization and psychosis, 2006, p. 37

Application: left-handedness

parce qu'on les a beaucoup contrarié à leur époque.

15:42 / 19:52

Application: clinical trials

Tirer au sort, ça « marche » pourquoi :

- Ça donne des groupes comparables ?
- Ça permet de faire des statistiques « propres » ?
- C'est neutre (« objectif ») ?
- Ça permet d'affirmer que le traitement est la cause de la guérison ? (et l'aveugle ?)

A B

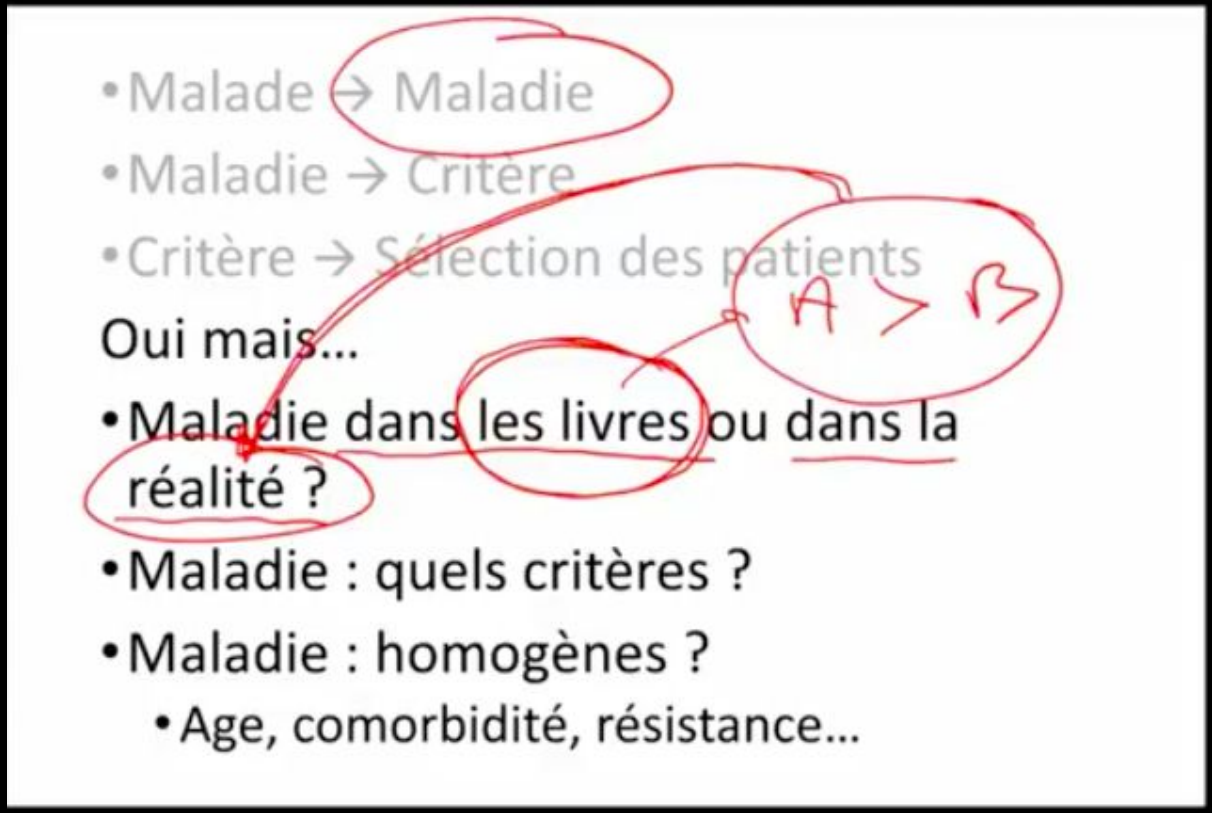
Contrafactuelle

Evaluation des thérapeutiques

2. Randomisation

c'est parce qu'elle concerne le sujet moyen qui n'existe pas dans la

Application: **clinical trials**



videos by Bruno Falissard (2018)

Application: gender pronouns

Application: gender pronouns

THANK YOU

FOR YOUR WORK AND ATTENTION!