UCLouvain

FIAL
Un éventail de formations, une multitude d'horizons

Kuhn 3

LFILO2602 – Philosophy of Science
Session 5

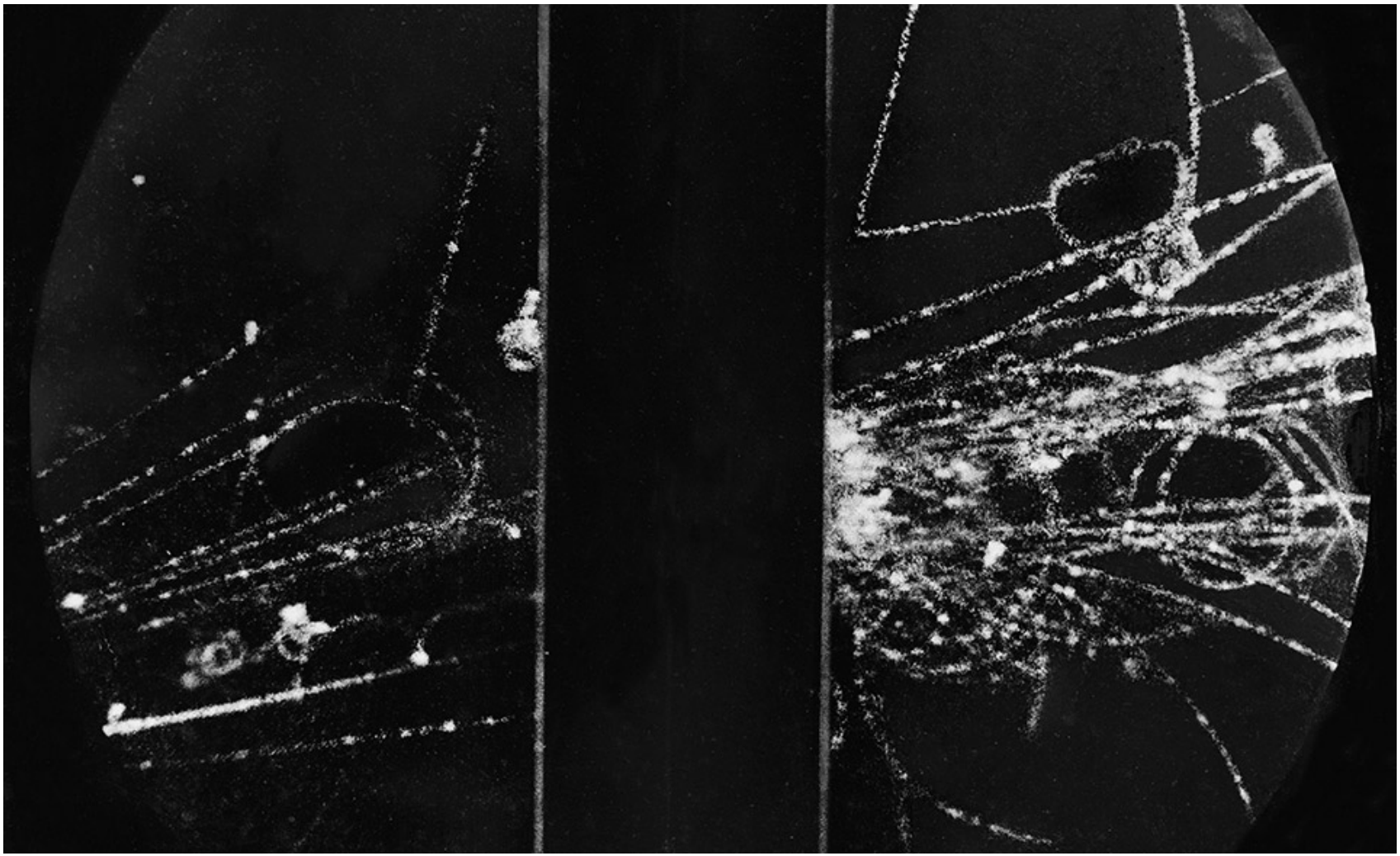
Summing Up

> Yet, whatever its force, the status of the circular argument is only that of persuasion. It cannot be made logically or even probabilistically compelling for those who refuse to step into the circle. The premises and values shared by the two parties to a debate over paradigms are not sufficiently extensive for that. (94)

Scientific Perception

> …paradigm changes do cause scientists to see the world of their research-engagement differently. In so far as their only recourse to that world is through what they see and do, we may want to say that after a revolution scientists are responding to a different world. […] [I]t is determined jointly by the environment and the normal-scientific tradition that the student has been trained to pursue. (111–112)

Cloud Chamber



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The Essential Tension

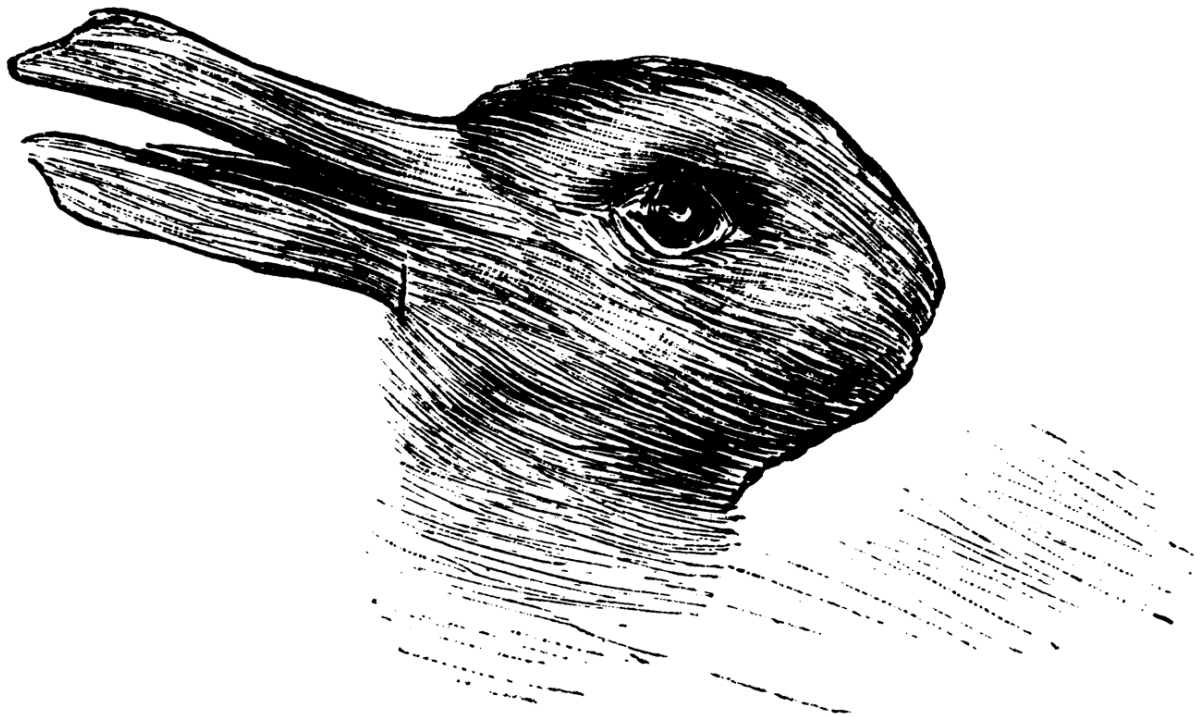
> . . . [I] wonder whether flexibility and open-mindedness have not been too exclusively emphasized as the characteristics requisite for basic research. I shall therefore suggest below that something like "convergent thinking" is just as essential to scientific advance as is divergent. Since these two modes of thought are inevitably in conflict, it will follow that the ability to support a tension that can occasionally become almost unbearable is one of the prime requisites for the very best sort of scientific research. (*ET*, 226)

Paradigms and Perception

> Surveying the rich experimental literature…makes one suspect that something like a paradigm is prerequisite to perception itself. What a man sees depends both upon what he looks at and also upon what his previous visual-conceptual experience has taught him to see. In the absence of such training there can only be, in William James's phrse, "a bloomin' buzzin' confusion." (113)

Duck-Rabbit

Welche Thiere gleichen ein-
ander am meiſten?



Kaninchen und Ente.

Duck-Rabbit

"There can be no peace until they renounce their Rabbit God and accept our Duck God."

An Important Distinction

> Aware that nothing in his environment has changed, he directs his attention increasingly not to the figure (duck or rabbit) but to the lines on the paper he is looking at. Ultimately he may even learn to see those lines without seeing either of the figures, and he may then say (what he could not legitimately have said earlier) that it is these lines that he really sees but that he sees them alternately *as* a duck and *as* a rabbit. (114)

An Important Distinction

> With scientific observation, however, the situation is exactly reversed. The scientist can have no recourse above or beyond what he sees with his eyes and instruments. If there were some higher authority by recourse to which his vision might be shown to have shifted, then that authority would itself become the source of his data… (114)

Different Worlds?

> Do we, however, really need to describe what separates Galileo from Aristotle, or Lavoisier from Priestley, as a transformation of vision? Did these men really *see* different things when *looking at* the same sorts of objects? Is there any legitimate sense in which we can say that they pursued their research in different worlds? (120)

“Interpretation”

> What occurs during a scientific revolution is not fully reducible to a reinterpretation of individual and stable data. In the first place, the data are not unequivocally stable. A pendulum is not a falling stone… More important, the process by which either the individual or the community makes the transition from constrained fall to the pendulum…is not one that resembles interpretation. (121–122)

« Interprétation »

> Rather than being an interpreter, the scientist who embraces a new paradigm is like the man wearing inverting lenses. Confronting the same constellation of objects as before and knowing that he does so, he nevertheless finds them transformed through and through in many of their details. (122)

Invisibility of Revolutions

> The result is a persistent tendency to make the history of science look linear or cumulative, a tendency that even affects scientists looking back at their own research. For example, all three of Dalton's incompatible accounts of the development of his chemical atomism make it appear that he was interested from an early date in just those chemical problems of combining proportions that he was later famous for having solved. (139)

The End of a Revolution

> If there were but one set of scientific problems, one world within which to work on them, and one set of standards for their solution, paradigm competition might be settled more or less routinely by some process like counting the number of problems solved by each. But, in fact, these conditions are never met completely. The proponents of competing paradigms are always at least slightly at cross-purposes. Neither side will grant all the non-empirical assumptions that the other needs in order to make its case. (148)

The End of a Revolution

> Again, that is not to say that they can see anything they please. Both are looking at the world, and what they look at has not changed. But…before they can hope to communicate fully, one group or the other must experience the conversion that we have ben calling a paradigm shift. (150)

Scientific Progress

> Why should the enterprise sketched above move steadily ahead in ways that, say, art, political theory, or philosophy does not? Why is progress a perquisite reserved almost exclusively for the activities we call science? (160)

Scientific Progress

> As a result, though new paradigms seldom or never possess all the capabilities of their predecessors, they usually preserve a great deal of the most concrete parts of past achievement and they always permit additional concrete problem-solutions besides. (169)

Truth and Progress

> The process described in Section XII as the resolution of revolution is the selection by conflict within the scientific community of the fittest way to practice future science. The net result of a sequence of such revolutionary selections, separated by periods of normal research, is the wonderfully adapted set of instruments we call modern scientific knowledge. (172)

Truth and Progress

> And the entire process may have occurred, as we now suppose biological evolution did, without benefit of a set goal, a permanent fixed scientific truth, of which each stage in the development of scientific knowledge is a better exemplar. (172–173)

Immediate Problems

- Incommensurability: too radical?
- Paradigm change: truth by consensus?
- The overall goal of science
- Two very different ways to do science
- Abrupt paradigm change

Postscript

> To a greater extent than other sorts of components of the disciplinary matrix, values may be shared by men who differ in their application. (185)

Epistemic Values

- Consistency (internal and external)
- Predictive accuracy
- Fertility
- Scope
- Simplicity (*ET*, 322)

Translation

Since translation, if pursued, allows the participants in a communication breakdown to experience vicariously something of the merits and defects of each other's points of view, it is a potent tool both for persuasion and for conversion. But even persuasion need not succeed, and, if it does, it need not be accompanied or followed by conversion. (202–203)