STS C200, Week 5: The Sociology of Scientific Knowledge

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1 Bloor [3, 2], Barnes and Bloor [1] on the Strong Programme

The strong programme of the sociology of knowledge clarifies some questions that arose in our discussion of last week's readings. Let us recall these questions. Following Kuhn [7], we wondered what exactly is relativism (that he worked so hard to avoid), and what would sociology of knowledge look like had it embraced relativism with open arms? Following Lakatos [8], the boundaries of sociology were left unclear; do questions about 'mathematical truth' fall under the domain of the sociology of knowledge? I describe the strong programme and how it addresses these questions.

The strong programme is a sociology of knowledge that enables itself to deal not just with failed theories, but also with successful ones. This is as opposed to the view that sociology is not applicable to successful theories, because the latter are successful due to their truthfulness or accuracy in representing nature, and therefore the particular social settings in which these theories are derived are of no relevance to the contents of the theories themselves.[1]

The strong programme is causal, impartial, reflexive and symmetric:[2]

- *Causality* establishes that identification of the causes of beliefs is the goal of the sociology of knowledge.
- *Impartiality* guarantees that no exceptions should be made for the beliefs held by the investigator.
- *Reflexivity* asserts that the sociology of knowledge should explain its own emergence.
- *Symmetry* asserts that true and false beliefs are generated by the same types of causes. Here "true beliefs" (resp. "false beliefs") is in the sense of "knowledge accepted as true (resp. false)."

These tenets, and the last one in particular, tie the strong programme with an epistemological relativism in an inherent connection. That is, the strong programme is (proudly) based on a relativist outlook. All that is left to address our Kuhn-related question is to conclude with a description of this relativism.

Relativism is the acceptance of three premises: (1) that beliefs on a certain topic vary, (2) that which belief is found is relative to the circumstances of the user, and (3) all beliefs are alike in being false or true with respect to the causes of their credibility. To reiterate, (2) and (3) mean that "because it is true" cannot be an answer to the question of why a certain belief has been held.

Mathematics and the sociology of knowledge In [3], Bloor presents how this rejection of "because it is true" challenges the (common) Platonic/realist view on the development of mathematics. He does so by invoking Wittgenstein [11] for an answer the realist perspective of Mannheim [9].

[1] Cf. Fleck's characterization of science as striving towards an objective truth [6], and Merton's universalism and disinterestedness [10].

[2] If only it were also transitive, then the strong programme would be an equivalence relation [12]...

Mannheim offers a realist view, in which mathematics is seen as "a realm of truth as such", and mathematicians discover objective truths through exploration of this realm. This realist view permits the sociologist to study questions adjacent to mathematical discovery (such as why a person studies a certain field within mathematics), but *not* the mathematical object itself.

Wittgenstein's non-realist view is that mathematics is a collection of norms and, like any institution, it is social in nature. If something appears true to a mathematician, it is because they conform to a social fact (see Section 2).[3]

Bloor sharpens this attack on realism by noting the circularity of realist epistemology ("it presupposes precisely what it sets out to explain".) Alas, he notes that this attack does not stand a teleological defense. Namely, if we assume that knowledge is naturally gained in the direction of truth, then the norms that govern our perception of truth are selected such that the movement is towards truth – and the circularity is resolved.

The conclusion is that Realism and the teleological assumption should be examined (and refuted) together.

Bloor harnesses Wittgenstein's views towards a sociological foundation[4] of mathematics, free of teleological assumptions.

This argument is presented using an example question: "What comes after 2,4,6,8?". Applying the obvious rule, the answer is "10". Applying this rule a few more times, we arrive at a large number, say "2020". What makes the applications of the arithmetic rule *correct* and *consistent* with each other? These two questions form the heart of the argument as follows.

The first question asks what makes an application of a rule 'correct'. The answer lies in the unity of meaning and use: what a formula means is the way it is usually applied. Note that 'usually' is a sociological term, and refers to one's education, the culmination of past uses, etc. Hence, this is a sociological question.

The second question asks what makes a number of applications of a rule consistent? The answer is that this consistency is a social fact (see Section 2). 'Sameness' is defined by and diffused among a group, and its definition is independent of individual uses.

2 Durkheim on Social Facts [5]

Let us briefly describe Durkheim's conception of a social fact.

Consider a system of acting, thinking or feeling that exists in an individual. A system is a social fact if (1) the individual is coerced into conforming to the system based on an external constraint, or (2) the system is diffused within a group and exists independently of its individual manifestations.

Language, religion,[5] and currency are all examples of social facts. The individual may try to forgo these systems, but immense pressure from society will force them to conform. Alternatively, each of these systems is shared among a group, and cannot be defined based on an instance in a specific member.

The examples discussed above are of rigid facts, but the definition of social facts extends also to systems with a less clear social structure. Consider a protest: a crowd of people collectively experiencing anger and indignation. Each member of that crowd is compelled (i.e., coerced) to feel these emotions. Thus, the crowd is establishing a social fact. Such flexible facts are referred to as social currents.

[3] This view is summarized in the memorable quote of Wittgenstein: "My having no doubt in the face of the question does not mean that it has been answered in advance."

[4] As noted in the text, this foundation is not in the sense of axioms and deduction systems, but in the sense of a school teacher laying the foundation for later learning.

[5] This does not refer only to the belief in a higher power. Durkheim defined religion as the "unified system of beliefs and practices relative to sacred things," [4] where 'sacred' means special or distinguished. Thus, for example, atheism (the belief in the lack of a higher power) exists within the religious system.

Questions and topics for discussions

- Recall Kuhn's view of academic education as the instilling of a scientific paradigm [7]. Compare this to Durkheim's assertion that education is the instilling of social facts.

References

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[4] Émile Durkheim, The Elementary Forms of Religious Life[1915]. Translated by J. Swain. Glencoe, IL: Free Press, 1947.

[5] Émile Durkheim, What is a Social Fact?[1895], in The Rules of Sociological Method.

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[10] Robert K. Merton, The Normative Structure of Science[1942], in The Sociology of Science: Theoretical and Empirical Investigations, Chicago: University of Chicago Press, 1973.

[11] Ludwig Wittgenstein, Remarks on the Foundations of Mathematics[1956], Oxford: Blackwell.

[12] Equivalence Relation. Encyclopedia of Mathematics. URL: `http://encyclopediaofmath.org/index.php?title=Equivalence_relation&oldid=35990`