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On Methods and Mess

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Abstract

Methodology after post-modernism must meet three challenges: (a) complexity / heterogeneity in the natural and social world; (b) bewildering mix of the true, false and fictive in the narratives; and (c) incompatible ideology and ethics in researchers. I argue that plurality in laws-generating models and methods takes care of natural and social complexity. Criticism of testimony enhances our capacity to discriminate truth from falsehood and from fiction. Ethnography of the self is a way to unburden ideologies from researcher's practice.

1 Introduction

Method is a special way of seeing. Seeing involves examining some phenomenon in relation to everything else. In fact, it has two-fold objectives. First, it aims to relate the phenomenon to the worldly context. A phenomenon is an interesting event in the context that draws our attention. But we do not simply pause over or past through it. We see how the emerged out of a given situation and why. The object of seeing is the process whereby contextual elements bundle up as a phenomenon. The object is, briefly, eventing. Second, seeing also links the enquiring person to the event. Seeing

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is a special stance we adopt to ask certain questions about events. The object of seeing is also therefore directed toward our posture: what makes us think certain events as requiring investigation and how we go about investigating them. These two aspects are relational. They emerge in the act of seeing.

There are, however, many ways of seeing (Berger, 1972). The term *method* is derived from *meta* ('after') and *hodos* ('a travelling, way'). It means 'a way to follow'. In the act of searching, the eyes follow the object, not the legs. In our use of the term, we still like to retain such objective sense. Yet in Sanskrit, a comparable term is *gaveshana*, which comes from a combination of *gau* ('a cow') and *eshana* ('desire'). Seeing in this tradition is akin to the leisurely munching of a grazing cow. It is unhurried, flexible, but goal-directed pursuit. Distinct from the both is the scientific method characteristic to all sciences.

Scientific method essentially consists of two steps. A phenomenon is enclosed within a boundary. Then it is allowed to interact with variables in a selective manner. In its elementary form, scientific method is therefore a set of two activities: First, one isolates the object of enquiry from its environment with a porous envelope. The porosity is actually a metaphor for a controlled interaction between the object and its environs. Second, one measures change in the system for unit changes (elasticity) in external variables. Often, external variables are either independent or their relations are defined through procedures such as dimensional analysis (Gauch, 2003).

Three key assumptions are thus inbuilt in the scientific method. One, the elasticity observations are or will be regular enough to yield general relations (laws) by induction. Two, these laws approximately describe the object's behaviour in the world. Three, the descriptions are invariant with respect to time, space and the practitioners' own inclinations and prejudices. Most of the time, the scientific method yields useful knowledge. Sometimes, it fails to do so. While the rigour of the method may be measured both against the successes and failures, its usefulness should be assessed against limitations posed by the assumptions.

2 An Account of Scientific Method

The following is a brief historical account of the scientific method. The account glosses over important shades, but is sufficient to understand, I hope, how we have come to take the assumptions as unquestionable. The positivists in the Vienna Circle believed that scientific method was about validating laws empirically (Stadler, 2001; Uebel, 2014). They argued that a theory which could not be verified either by testing against the observations in the physical world (substantially) or against the valid mathematical constructions (logical proof) was invalid. Further, they argued that only testable statements were the objects of scientific method. That is, if a statement cannot be verified, it is or should be outside science.

Karl Popper criticised the verificationism of the Circle. He argued that scientists did not always employ inductive reasoning. Nor did they discover laws while validating older laws (Popper, 1959). Instead, discoveries occurred when they tried to disapprove dominant theories. Scientific progress, according to Popper, occurs in trying to falsify existing laws. Popper proposed that a theory is scientific if and only if it allows tests to falsify it. Such as Einstein's design of the experiment to contradict his own theory of general relativity, or to given a recent example, Higg's prediction of the existence of the 'god particle', followed scientific method. All non-falsifiable propositions, for Popper, are metaphysical and beyond the purview of science. Only logical and physical experimental methods which generate counterevidence to the existing theories, in this view, are scientific.

Popper's followers, we may call them epistemologists for their persistent search for the conditions of knowing, believe that scientific method is the only way to progress. Their beliefs imply peculiar views about the existence of the world (ontology). First, the reality 'out-there', or 'to be known', is single. Consequently, when variation attributable to the enquirer is subtracted from observation, a real non-contradictory world can be reconstructed and represented. Second, the reality has several distinct fundamental dichotomies such as subject vs. object, humans vs. non-humans, mind vs. body, and micro vs. macro. This positivist ontology views imply that the world exists independent to the enquiring subject. And, that it is possible, and indeed desirable, to have objective representation of the world. Further, a totality of such representations will eventually add on, approximating the essence of the unitary world. The views also entail that while there is a general unanimity on the requirements for any method to be scientific, the method itself may be adapted as required by the intrinsic categories in the world. The scale and level of observation may be tuned to the scale and level of reality one may like to measure.

3 Challenges to Scientific Method

The scientific method and the positivist ontology have been challenged from three perspectives. First, the knowledge anarchists (also called epistemological anarchists) have said that there is no universal and exception-free method. They argue that both reason and rationality, the supposed hallmarks of science, play no significant role in scientific theorising. Instead, historical evidence suggests that aesthetics, personal whims and social factors shape the theories. They advance, for instance, Galileo's fantastic arguments in support of the heliocentric worldview (Feyerabend, 1987, 1993).

Second, the sociologists of scientific knowledge, SSK, have demonstrated that logical and experimental methods have in the past yielded both true and false knowledge. In other words, scientific method is not superior to other empirico-rational methods. In fact, what counts as the rational or empirical depends on special forms of cultural resources called paradigms. Scientists normally

work within a paradigm and have their own stock of scientific methods. SSK therefore posits the possibility of (plural) scientific methods: the proponents of two scientific paradigms, spaced by a revolution, can employ methods that may look unscientific to each other (Kuhn, 2012, 1990).[1]

Third, the proponents of the actor-network theory (ANT), and their new avatars, the material-semioticians, have challenged the scientific belief that the categories such as humans vs. non-humans, micro- vs. macro-levels, self vs. non-self, mind vs. bodies, materials vs. ideas, theory vs. method, are empirically distinct. They argue that a method that proceeds to investigate the world of distinctions (as scientific method does) cannot reflect onto itself. It can neither describe the scientific practice nor explain the emergence of scientific facts. They have demonstrated that these categories in science are instead merely effects of the network of relations. Both facts and technologies, in this view, are social assemblages or social constructions (Latour and Woolgar, 1986; Latour, 1987).

In general, these critics are asserting that both scientific theory and method are in practice plural and located in the social. They are not, as mistakenly propounded in the postmodern literature, stating the impossibility of the scientific method (Feyerabend, 2011).[2] For instance, SSK proposes that appropriate form of expertise, or public trust on the scientists, settles the issue of what counts science and what not. ANT suggests that studies of relations (reassembling) will generate too much of categories (pluriverse). But a slow, deliberate and appropriate selection of particular realities and provisional fitting them together (constitution) create the single coherent world as apprehended by the scientific method.

Together these critics have emptied the scientific method of its supposed intrinsic merits (such as objectivity, rationality, logical empirical) and emphasised that 'due process', such as the critical role played by the experts or the coherent constitution, makes a method scientific.

Epistemological Anarchists (following Fayerabend) rejects logic in the method. They call for practicing creative anarchism instead of any methodology. But surely science, like religion and other ideologies, has yielded some useful knowledge about natural and social worlds. Instead of casting it aside, perhaps more attention should be focussed on where it has failed.

The failures of scientific method cluster around three points. First, scientific method has failed to fully account for the complexity/heterogeneity of the natural and social world. Second, it is poor in discriminating the true, false and fictive in the existing 'prose of the world'. Third, it is

[1] Kuhn's description of scientific revolutions goes like this: Every paradigm has unsolved problems (anomalies), such as empirical data existing theories cannot adequately explain (when political revolutions happen?), or theories unsupported by evidence (viz. existence of the Boson particle). Scientists try to reduce these anomalies by applying methods they know. But anomalies keep on increasing until a revolutionary genius (Copernicus, Einstein etc.) proposes a new epistemological arrangement that appears to solve the puzzles. The community of scientists then abandon the old paradigm and start to work within the new one (scientific revolutions). The two paradigms, spaced by a revolution, are incommensurable.

[2] Exception is the latter Fayerabend.

inadequate to resolve the incompatible blend of ideology and ethics in researchers. In the rest of the essay, I point to three methodological innovations that will better tackle these issues.

4 Three Methodological Innovations

It is not realism that is scary about science, but its fundamentalism. Fundamentalism comes in many disguises in the world of science. It shows up in statements which suggest that the scientific laws are true or are approaching truth, and that they are few in number, simple and all-embracing. An enduring view in this regard is expressed in terms of a belief in 'theory of everything' (universalism). Fundamentalism also appears as an imperialism of physics in natural sciences, and that of economics in social sciences (Cartwright, 1997). It sees properties in all branches of knowledge as ultimately explained in terms of physical properties (depth-wise reductionism) and laws from one domain as applicable to other domains (cross-wise reductionism).

Such fundamentalism is fundamentally wrong, at least for two reasons. First, the world is heterogeneous and complex. Because of such character of the world, scientific laws formulated out of the observations in an experimental closure never works in real environment. This is partly because the world exhibits more number of interferences than that which could possibly be accounted for in deriving the laws. Observable regularities do not also always imply valid induction. Russell's chicken, for example, believes that its caretaker would appear every morning to feed her until the day he appears with a knife.

Second, given the dappled nature of the world, the world out-there may well be just 'a patchwork of laws', and not unitary. In such a case, reductionist agendas such as specifying physical properties to determine the biological states (supervenience), and suggesting the emergence of macro-properties 'out of nowhere' as one shifts from quantum to classical domains (emergentism) will have to be abandoned. Indeed, supervenience presumes unascertainable token to token systematicity among the properties. And, emergentism includes some properties that appeared to emerge because we did not choose to see it, in the first place, in our world-view (Cartwright, 1999).

5 Nomological Plurality

A sort of nomological plurality has to be allowed therefore to overcome the frustrations arising out of natural and social complexity. There has to be multiple ways both to posit laws and to prove them. All laws should be taken as local and all methods, provisional. Models of nature and society essentially yield questions that have uncertain answers. It does not mean that the laws generated from these models will not have sensible abstractions. They will have, but concepts such as force, money, or caste, are not empirical properties of the world, but are simply ideas that seem to be out there.

Nomological pluralism argues for multiple descriptions and explanations of a phenomenon in the messy world. But why attribute the messiness only to the world? Methods themselves are rooted in the world. They must share its messiness for three good reasons. First, the distinctions among theory, method and substance are not steadfast, and each shapes the others. Second, some (such as the proponents of the 'critical school of Frankfurt') resist the distinctions but widen the gap between theory and method further (Habermas, 1978). Third, the method-as-tool approach implies a false, single reality world with distinct knowable/reportable categories.

A way forward is to take the co-constitution of the world and its representations seriously. For, methods are doubly social. Methods are fully imbued with the theoretical renderings of the social world. Each of them has purposes and advocates, and hence an ideology. They configure and reconfigure the world (viz. census survey categories create or omit categories we think real) (Law et al., 2011). Every method is therefore a problematic social phenomenon. It should be treated as a bundle of co-constitutive relationships (a) between representations and findings in a nomological machine; (b) between the realities and the machines, and (c) between its advocates and their institutional contexts. Every method is an assemblage of relations. A sound methodology enquires into the structure of the assemblage.

6 Discriminating Fact, False and the Fictive

Postmodern scholars mistakenly extend the criticisms of scientific method to all possible enterprises of knowing the world, including those championed within anthropology, sociology and history. There is no denying that historiography, for instance, has a subjective component and a relational component. But the postmodern scepticism, which aims to deny any possibility of collectively knowing the past, cannot be justified. The answer to such wholesale criticism consists in reading any representation of the world – be it historical, fictional or any other – in a way that can discriminate the fact, false and fictive. The discriminating capacity may in part be enhanced by a studious criticism of testimony.

Let me explain. While there is no formal distinction among true, false and an inventive statement, certain statement can produce in its readers an effect of reality, while others fail to do so. The 'reality effect' is the impression that the reported event or phenomenon seems to have happened in the world out there. Enquiries into reality effect lead us to textual analysis and criticism and not to the attempts to relate the text to the world empirically. Concerns for verification or falsification are therefore unimportant. Instead, one may investigate, for example, the place of evidence in the text. The typical questions in this regard may be these: What purpose does evidence serve in the text? Is the evidence presented in an accessible fashion? To what extent is the evidence scrutinised and on what basis? Etc.

A writer's particular style of demonstrating his/her experience to the readers may create such an effect. When a text, for instance, has rich and vivid details, the readers imagine them as if they are recalling them (Ginzburg, 2011, p. 12). This is rhetoricians' take of historical writings. Another way of creating the effect of reality is by demarcating primary and secondary sources in the texts, and according a higher truth-value to the former. The early moderns in Europe did this by distinguishing annals from history, which gradually displaced all annalistic and rhetorical portions in the narrative to the notes and citations. The creation of 'evidence' was intended to make history more credible. Paradoxically, the very style made the knowledge of the past more indirect and more uncertain (Ginzburg, 2011, pp. 18-24).

A sound source criticism will, to begin with, ignore such authorial hierarchy in the narratives. Next, unique testimony (read: evidence) will be scrutinised against itself and its material constitution. There is something to gain from both content and discourse analysis here. For several comparable testimonies, exact repetition or entire discordance leads one to doubt that one is fictive or false. Statistical tests such as word frequency, sentence length, as well as averages and deviations in the reported data may also help discriminate the facts, from false and the fictive, and can help identify the direction of influence. The last discriminating factor hinges on the notion of probability. After all, the past must be the most probable of all possibilities as it has happened. So when a testimony describes an affair that appears unlikely in the context it reports, it is either false or fictive. And when an account describes a less probable event in a sound context, the account is almost always invented (Bloch, 1953, towards).

7 Reflexive Ethnography

The last pointer to a new, richer methodology for the post-postmodern times is the critical ethnography of the self. The STS critics of the scientific method have demonstrated that knowledge production and distribution is never free of ideology. Consequently, there is a widespread hullaballoo about meta-discourse and deconstruction. It is fashionable to scorn upon all forms of authority (the state, scientists, and the experts) as the powerful originator of discourse. Ironically, many critics of science do not seem to be aware of their own ideological constraints. Where they do acknowledge influence, its implications for their methodology and conclusions are not always clear. They have accused the rationalists and empiricists of pretence rather crudely. They should practice what they preach. All enquiries into the world therefore should begin with a cruel self-examination.

"I do not intend to indulge in the genre of autobiography". This is the first line of Bourdieu's last book Sketch for a Self-Analysis. The book is a close and hard investigation on the social structures and relations that contributed to his personal characteristics and career (Bourdieu, 2007). In my view, that little book has set the standard for all critical auto-ethnography. It is both reflexivity at

its sharpest and criticism at its most disenchanted form. If the researcher's self, as ANT tells us, is merely a node in a network of relations, or a bundle in the space-time of power and history, a sound methodology will involve explicating the strands of the social that constitute the researcher. Explication here means demonstrating how the self, the enquiry it conducts, and the method it follows all are located in a particular set of ideological concerns and preoccupations. The self, in other words, is the primary site of social enquiry par excellence in a new methodology.

8 Conclusion

Let me summarise the key points. Various strands in STS have shown that the scientific method as we know it is ill-equipped to deal with both natural and social world. Everything in the world is messy: its realities are complex and heterogeneous; its representations are a bewildering mix of the true, false and fictive; its researchers, sharing the world with their research objects, have incompatible ideology and ethics within them. The 50-year-long bout of postmodern criticism of natural and social sciences has convinced us of these. In this essay, I argued for a new, more mature methodology that could handle the postmodern legacy well. I suggested that such a methodology would operate within diverse law-generating models (nomological machines). It would be an assemblage of methods, each method aiming for securing a particular combination of description and explanation. The plurality of laws and methods does not mean that the researcher's capacity to discriminate the fact from the false and fictive has been lost forever. To the contrary, I argued that a studious criticism of testimony would help us distinguishing them. While deconstruction and reassembling, the two supposedly postmodern techniques could certainly assist us in analysing the way the world operates, I called for all criticism to begin by assaying the researcher's self. The combination of plural outlook for the models and methods, and critical in-look at the self will, I hope, enable us to cope with the messy world we live in.

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