

Reflexivity: curse or cure?

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Abstract Reflexivity has been argued to be self-defeating and potentially devastating for the sociology of scientific knowledge. We first survey various meanings associated with the concept of reflexivity and then provide an interpretation of Velázquez's *Las Meñinas* to generate a three-part taxonomy of reflexivity, distinguishing between 'immanent', 'epistemic' and 'transcendent' reflexivity. This provides the basis for engaging with reflexivity as a problem in the economic methodology literature, focusing on recent contributions to the topic by Hands, Sent, Mäki and Mirowski. Employment of our taxonomy clarifies the similarities and differences between the various forms of reflexivity that can be identified or are addressed in these contributions. Our main argument is that a successful response to the malign aspects of reflexivity requires a simultaneous consideration of various levels of reflexivity and relies on social–historical perspectives.

Keywords: economic methodology, reflexivity, self-reference, SSK

1 REFLEXIVITY: PRELIMINARY REMARKS

The concept of reflexivity is used in the social sciences in a number of ways. The noun from which it is derived has both a physical and human dimension. From the Latin *reflectere* or 'bending back', 'reflection' may refer to the reflection of a beam of light, for example, or to the act of considering something in thought. 'Reflexivity' has retained these two dimensions in alluding both to self-reference and to (self-) reflection.¹ On the most general level, one can define reflexivity in set theoretical terms. A relation R is reflexive in a set S if and only if it relates every element a of the set to itself (aRa). Linguistically, a pronoun is reflexive if it refers back to the subject of a sentence. A recursive function such as the faculty function² is another instantiation of reflexivity of this basic kind, as is Maurits Cornelius Escher's lithograph *Drawing Hands* (1948).³

Types of reflexivity may be distinguished by either attending to the type of entity which relates to itself, or to the nature of the reflexivity relation itself. According to the former, one could, for example, distinguish between entities such as propositions, thinking subjects, individuals in a social group referring to themselves, or different areas of inquiry, and thus arrive at different notions of reflexivity. We follow here the second



Figure 1 *Las Meninas* (Diego Velázquez de Silva, 1656; with kind permission of the Museo Nacional del Prado, Madrid)

strategy by distinguishing types of reflexivity according to qualitatively different forms of reflexivity relations. Given the vast literature on self-reference and reflexivity which we have no ambition to review here (see Bartlett and Suber (1987) for an introduction), we opt for introducing and illustrating the notion of reflexivity through a visual metaphor.⁴

Consider Diego Velázquez de Silva's exploration of reflexivity in his painting *Las Meñinas* ('The Ladies-in-waiting', 1656; cf. Foucault 1966: 19–31; Hurley 1986; Foti 1996; Figure 1). It depicts a room with the Infanta Donna Margarita, the five-year-old daughter of Philip IV of Spain and his wife Mariana, at its centre, attended to by her entourage. The impression of the Infanta being the subject of the painting, however, is unsettled by a large canvas reaching into the scene from the left. Busy with the canvas, of which we see the rear only, is a painter who looks us straight in the eye. This painter is Velázquez himself, evidently in the process of painting someone not in the painting. Once we realize this, our attention falls on a mirror hung from the rear wall of the room. In this mirror we recognize the vague contours of Philip and his wife Mariana as they are being painted on the canvas. Evidently, the couple is being portrayed while they are watching both their daughter, who returns their gaze, and Velázquez while he is painting them. But competing with their occupancy of the space in front of the painting must be Velázquez himself, who is outside the painting just as are his models. As if this were not enough, superimposed onto this double, two-levelled occupancy of the space in front are we ourselves, who view the painting of the Infanta, and imagine the royal couple and also Velázquez as he paints *Las Meñinas*.⁵

We distinguish three levels of reflexivity in *Las Meñinas*.⁶ First, this is a painting about painting. Evidently, the image of the royal couple in the mirror is being painted on the canvas, and the whole set-up of the painting fundamentally rests on the relationship central to any act of painting: that between the object and its depiction. The fact that we cannot see the surface of the canvas within the painting only heightens our interest in the act of painting itself, as does the central position in the painting of the painter behind the canvas as he looks at his object. We characterize this relationship between the canvas and its object as it is being captured in *Las Meñinas* as *immanently reflexive*. The object in front of us reflects on the act of painting, while itself being a painting.

Whereas the reflexivity just discussed is immanent in the painting as such, without the need to bring any other information to bear, our second type of reflexivity reaches beyond the confines of the canvas. It turns on the reflexive relationship between the painter and his work. Consider Velázquez outside of the painting, who portrays himself in a self-portrait at the edge of the canvas depicted in the painting. We call this *epistemic reflexivity*, because the painter Velázquez makes the painter Velázquez his object. We only know this because of our reliance on other sources of

information which have convinced us that the painter depicted in the painting is indeed Diego Velázquez de Silva, the creator of *Las Meñinas*. Note that both aspects are important: Not only do we need to be able to identify Velázquez in the painting, we also require the additional knowledge that he is the painter of *Las Meñinas*. Note further that while any painting would exhibit traces of the reflexive relationship between the painter and his work, we will only speak of epistemic reflexivity if this relationship has been consciously made explicit by the painter. The reflexivity, turning on the self-depiction of the painter, is of an epistemic nature as its presence brings to light the foundations of the painting as a representation, attending to its perspectivity and point of origin.

Third, consider both the royal couple and us ourselves. We share with the couple the status of ‘patrons’ of *Las Meñinas*. They directly so in having commissioned the painting and we indirectly as being interested in its status as art. We label this last form of reflexivity *transcendent reflexivity*, because it literally transcends the canvas of *Las Meñinas* and the painter painting himself by bringing to bear the ‘patron’ space external to both the painting and the painter–work relationship.⁷ Put differently, epistemic reflexivity rests on an individualistic reflection on the nature of (the) painting. Transcendent reflexivity, on the other hand, draws attention to the social–historical context of (the) painting.⁸ Both differ from immanent reflexivity, which is confined to the object of investigation itself.

The three forms of reflexivity we have identified operate simultaneously in *Las Meñinas*. We will use them as a template to organize our discussion of reflexivity in economic methodology. In doing so, we regard economic theories – and metatheories – as ‘accounts’ of something. As we are interested in reflexivity independently of any particular stance regarding what economics is about we intentionally leave the interpretation of this ‘something’ open. Similarly, we are not committed to any particular interpretation of the relationship between economic theories and their objects. Speaking of ‘accounts’ leaves open whether these accounts are representations, for example, or whether they are to be explained in other ways.

In generalizing from our illustrative discussion of types of reflexivity in *Las Meñinas* we thus distinguish between immanent, epistemic and transcendent levels of reflexivity in economic methodology. Immanent reflexivity is confined to the account itself, epistemic reflexivity results once the author of the account includes a self-depiction, while an account exhibits transcendent reflexivity when it mobilizes the patron space in which both the account itself and the author are embedded. In principle, any of these three levels of reflexivity could be combined with any of the others. We will use these more complex interrelationships between levels of reflexivity in our discussion of reflexivity in economic methodology below to arrive at a classification along three dimensions. While each level taken on its own throws a particular light on reflexivity, what we

are interested in is how our understanding of reflexivity on one level may be affected by our understanding of it on another level.

2 REFLEXIVITY AS A PROBLEM

In the methodology of the social sciences, reflexivity is frequently discussed as a ‘problem’ which threatens to undermine the research efforts of the social scientist (e.g. Gordon 1991: 655–7). What is more, philosophers have long regarded reflexivity as a potential threat to logical reasoning. Before turning to a discussion of reflexivity in the context of economic methodology, we thus briefly revisit some important misgivings from these two quarters.

One of the canonical illustrations in philosophy of the problems associated with reflexivity can be found in what has become known as the ‘Liar’s Paradox’. Consider the following proposition p: ‘p is false’. If p is true, it follows that its declaration that it is false is correct. Conversely, if p is false its negation must be true so p must be true. In both cases we arrive at a contradiction. *Ex contradictione quodlibet*: The Liar’s Paradox, as a specific form of what we have called immanent reflexivity, poses a threat to traditional logical reasoning, and to the extent that rationality presupposes the law of non-contradiction be observed, also to the rationality postulate. Note that this threat is not due to immanent reflexivity as such. The statement q: ‘q is true’, while immanently reflexive, is wholly benign. Its reflexive nature ensures that it is necessarily true because to assume the opposite results in a contradiction. Let us apply this distinction between the logically benign and malign faces of reflexivity more generally to all three levels of reflexivity that we have identified. Reflexivity, at any level, that threatens to undermine itself is malign, whereas we will regard it as benign if it has a self-reinforcing character.

In the context of economic methodology, the distinction between benign and malign reflexivity has become particularly important in discussions surrounding the sociology of scientific knowledge (SSK), in particular in connection with what has become known as the ‘Edinburgh School’. In a nutshell, proceeding from psychological and social factors (with an emphasis on the latter), SSK studies scientific knowledge symmetrically as a form of institutionalized belief, independent of whether particular claims to knowledge are regarded as true or false either by the agents under study or by the analysts themselves (Bloor 1991: 7). This seems to open up a reflexivity dilemma once one applies SSK to its own scientific claims. On what grounds can SSK defend its own statements as true? The dilemma is most acutely felt by philosophers, who fear the relativist implications of SSK. Consider Alvin Goldman’s (2001) discussion of SSK in the online *Stanford Encyclopedia of Philosophy*: ‘[H]istorical case studies undertaken by members of the Edinburgh School attempt to show that scientists are heavily influenced by social factors ‘external’ to the proper business of science’. Note from this

quotation that the operation of social factors is pitched against the 'proper business of science', a move rejected by Bloor (1991: 12) because it would reduce SSK to a 'sociology of error'. Nonetheless, given his negative view of the role of social factors in scientific inquiry, it is no surprise to see Goldman (2001) continue that '[i]f . . . these claims were right, the epistemic status of science as an objective and authoritative source of information would be greatly reduced'. SSK is obviously seen as a malign programme that threatens to undermine or to 'debunk' science.

Thus, Goldman (2001) argues:

How can these studies establish the debunking conclusions unless the studies themselves have epistemic authority? Yet the studies themselves use some of the very empirical, scientific procedures they purport to debunk. If such procedures are epistemically questionable, the studies' own results should be in question. There is, in other words, a problem of 'reflexivity' facing this type of debunking challenge.

If one accepts Goldman's charge, the conclusion must be that applying SSK to itself results in the familiar Liar's Paradox type of contradiction. SSK holds that scientific knowledge is affected by social factors.⁹ Goldman adds to this the implicit premise that social factors distort scientific knowledge. Hence, if SSK makes any claims to scientific knowledge, these will be distorted as well. In brief, SSK makes propositions of the kind *p*: '*p* is false'. It suffers from a malign reflexivity.

In sociology, anthropology and related fields, by contrast, reflexivity *post* Geertz (1973) is not regarded as a problem of logical inconsistency but as one of lacking self-awareness. In our terms, it is not immanent reflexivity which threatens to undermine SSK, but the lack of an additional epistemically reflexive dimension. 'To be reflexive, in terms of a work of anthropology, is to insist that anthropologists systematically and rigorously reveal their methodology and themselves as the instrument of data generation' (Ruby 1980: 153). This imperative derives from a premise inverse to Goldman's: Scientific knowledge, like any other form of knowledge, is seen as socially constructed. Methodologically, sociologists and anthropologists should acknowledge this dimension in their own research, rather than implicitly arguing from the epistemologically privileged position of scientific objectivity which social constructionism seems to call into question. Translating this into a criticism of the traditional SSK approach, 'reflexivity asks us to problematise the assumption that the analyst (author, self) stands in a disengaged relationship to the world (subjects, objects, scientists, things)' (Woolgar 1992: 334). Woolgar calls on us to abandon the implicit premise of the independent or privileged position of the analyst of scientific knowledge.

In our terms, what these critics call for is attention to epistemic and/or transcendent dimensions of reflexivity in SSK. Both Goldman and Woolgar

claim that the reflexivity displayed by traditional studies of SSK is malign in that it undermines the original endeavour. Only the philosopher regards this flaw as fatal to the whole project, however, identifying an immanently reflexive relationship which he says is damaging because it undermines the epistemic authority of SSK. In identifying immanent reflexivity, this argument points to the alleged neglect of a crucial epistemically reflexive relationship, which, by revealing the perspective of the social scientist engaged in SSK, uncovers its perspectivist limitations. While the philosopher thus criticizes the presence of (immanent) reflexivity, the social researcher, chastened by Geertz, complains of the lack of (epistemic) reflexivity. At the same time, immanent reflexivity is accepted as a fundamental given. Taken seriously, Woolgar's demand appears to suggest a merging of the documentation of research results with a quasi-autobiographical dimension which traces the emergence of the underlying research methodology in an epistemically and/or transcendently reflexive way. We pursue this possibility in the discussion below.

3 REFLEXIVITY IN ECONOMIC METHODOLOGY

How has the concept of reflexivity been addressed in economics? The ways in which it has affected economics and economic methodology are introduced and summarized by Hands (1994a, 1994b, 1998, 2001), made central to explanation of the development of Sargent's work in Sent (1998), applied to the notion of a free market for scientific ideas in Mäki (1999), and figure in the history of game theory in Mirowski (2002). Here we survey these contributions, using our three-fold classification of reflexivity, and comment on the issue of whether reflexivity undermines social science. Figure 2 provides a summary statement of our main conclusions.

3.1 The naturalist turn

Hands' (1998) *The Handbook of Economic Methodology* entry introduces reflexivity via its treatment of social science and SSK. Essentially, reflexivity exists when the claims social scientists make about social behaviour apply to their own behaviour as well. The SSK motive for introducing reflexivity was originally to produce better science by debunking or unmasking the epistemic privilege of scientists (in critique of Mannheim [1936]), but much of SSK's subsequent development can be understood in terms of whether reflexivity is seen as benign or as leading to sceptical conclusions about the possibility of science. The former view – associated with the Edinburgh School – assumes that allowing social interests and processes to underlie the work of social scientists does not bring that work into question. The latter view – labelled the 'hyperreflexive' school – holds that allowing for reflexivity transforms the relationship between investigator

	Immanent	Epistemic	Transcendent
Hands	ESK (economic methodologists)	Naturalized epistemology	Ambivalence
Sent	Rational Expectations (Sargent)	Symmetry	Pluralism
Mäki	Economics of economics (Coase)	The scope of economics	The Petition
Mirowski	Game theory (the 'Colonel's dilemma')	The status of game theory	Deception

Figure 2 Reflexivity in economic methodology

and subject matter in such a way as to be potentially self-defeating for science as traditionally conceived.

Hands identifies reflexivity problems arising in three locations in economics and/or economic methodology. First, Marxian economics exhibits reflexivity in that, should material conditions determine consciousness, Marx's own critique of capitalism should be an expression of material conditions. While this sets up an immanently reflexive relationship in Marx's account of capitalism, it also appears to suggest a solution to the problem. If the complaint is the lack of epistemic reflexivity, as Marx does not apply his analysis to his own work and hence to how material conditions have influenced his authoring of the critique of capitalism, presumably a successful accommodation of the criticism would consist in developing the epistemically reflexive dimension. Since this issue and the problem of how one addresses immanent reflexivity is very much like the one confronting SSK, we return to it after our review of reflexivity in economics.

Second, Hands considers the application of SSK to the practice of economists as potentially reflexive. 'If the theorizing of economists is best understood as a product of various social forces, should not the theorizing of the historians looking at those economists also be understood as a social product?' (Hands, 1998: 415). Here, a social-historical account of economics becomes a social-historical account of itself, so again, the issue of immanent reflexivity comes to the fore. Note, however, that, unlike the philosophers' charge of internal inconsistency against immanent reflexivity, Hands seems instead to see the matter in terms of how one addresses immanent reflexivity. As with his discussion of Marx, immanent reflexivity

is not a problem once it has been recognized and addressed by adding an epistemically reflexive dimension.

Third, Hands' (2001) *Reflections* book examines reflexivity in connection with the economics of scientific knowledge (ESK) – one development of SSK. There, he surveys economic methodology since the abandonment of logical positivism as a 'received view', arguing that methodologists until recently have employed an 'off-the-shelf' strategy involving borrowings from philosophy of science re-applied to economics, and that there are now philosophers of science who borrow from economics using ESK. Were economic methodologists to continue to take their lead from the philosophy of science, this would arguably involve a circular flow of ideas between these two meta-perspectives on science.

We believe this third issue nicely illustrates the three dimensions of reflexivity, and discuss them sequentially in the balance of this section. (1) The immanent reflexivity issue is whether the bootstrapped foundation of economic methodology rests on sound foundations when economic methodologists take recourse to a philosophy of science derived from economics. (2) Given this immanent reflexivity, we ask whether its benign or malign nature is influenced by the methodologist's awareness of it. Here we focus on Hands' own commentary as an instance of epistemic reflexivity in connection with one of four issues Hands believes central to applying a Quinean naturalized epistemology to economic methodology. (3) In this case, the issue is the reception of *Reflections* itself by economic methodologists. To the extent that Hands takes this into account in his analysis, he adds a transcendent reflexivity to his work.

(1) Hands draws on Quine to explain methodologists' departure from the 'received view'. The key to this argument is Quine's naturalized epistemology, which involves an inversion of the traditional philosophy of science view that philosophy is the queen of the sciences, and thus foundation for science, for the view that philosophical concepts and principles find their foundation in the sciences.¹⁰ Hands believes that economic methodology has followed Quine's recommendation and that recent economic methodology involves a series of 'turns' by which it accepts different sciences (biological, social, economic) as foundational for methodological reasoning. These different 'naturalising turns', however, only graduate to an immanent reflexive relation when philosophy of science 'naturalises' on economics and when economic methodology then draws upon this specific naturalization. Among methodologists there is some debate over whether this circularity/reflexivity is benign or destructive (cf. Hands 1995; Mirowski 1996; Davis 1997; Mäki 1999; Sent 1999). But since most criticism is directed at what kind of economics is borrowed for philosophy of science, the consensus seems to be that the general relationship is benign while certain types of borrowings are potentially self-defeating. This latter case, moreover, would depend upon

a somewhat uncritical uptake of ESK in economic methodology – an event that seems unlikely.

(2) Epistemic reflexivity enters into Hands' argument in connection with the stance he takes, as an economic methodologist himself, toward the immanent reflexive relationship between economic methodology and philosophy of science. Hands sets forth four issues he regards as central to Quinean naturalized epistemology: whether one is a reformist or revolutionary in regard to naturalized epistemology; which science one naturalizes 'on'; the roles for prescription vs. description; the seriousness of the circularity issue (pp. 132ff). We first focus on the third issue – prescription vs. description – because of its centrality in the overall history Hands delivers.

The 'received view', Hands emphasizes, was highly prescriptive, since it was a matter of explaining what constitutes 'good' science. But a Quinean naturalized epistemology philosophy of science is essentially non-prescriptive, because it simply describes scientific reasoning as it is exhibited in one science or another. Applied to economic methodology, methodologists non-prescriptively describe economists' practices without judgement or evaluation. Hands accordingly re-defines economic methodology post-Quine as the '*interpenetration of economics and science theory*' (p. 7; original emphasis) on the grounds that methodologists no longer occupy some separate, privileged position from which they might judge economics. He asks us, 'How can one justify the practices of a certain scientific community when the standards for epistemic justification were based on the theoretical practices of that same community?' (Hands 2001: 135). His conclusion is thus that this reflexivity undermines evaluative economic methodology (ibid.: 391).

But, if accepted, this conclusion also applies to Hands' own contribution to economic methodology, which adds an element of epistemic reflexivity. Should the result of his own analysis be prescriptive, he would be open to the charge of inconsistency and his analysis would then exhibit malign immanent reflexivity. However, being aware of this immanent reflexivity adds an epistemic reflexivity dimension by demonstrating how his methodological position affects his own account, which, as a result, would have to be equally non-prescriptive. In this case, immanent reflexivity would no longer pose a problem.

Yet, should economic methodology exclusively and exhaustively naturalize on economics, it would effectively efface itself, essentially rendering the methodological enterprise a self-declared positive economics of economics. Should we, thus, just listen to how economists describe their practices? Were economists to comment on their work with any sort of philosophy of science perspective, they would need to relate it to the economics of economics debate, or they could be said not to have engaged the argument at all. Hands

is sceptical that economists are likely to be successful in this regard. He also presumably believes that his own survey of economic methodology could not have been written by an economist practitioner, *and* that it is illuminating. Implicitly, illumination also delivers judgements and prescriptions based on a privileged position, however indirect and obscure they may be. But Hands is steadfast to the end in his book in not drawing such conclusions. The old logical positivism was positivist in virtue of taking the reports of sense and the intuitions of *a priori* logic as given. The post-Quine, naturalized epistemology 'new positivism' takes the reports of scientific practitioners as given. More specifically, if new economic methodology as set forth by Hands eschews the old demarcationist methodology that made sweeping judgements about scientific research programmes, then what goes unchallenged as science are economists' basic projects: game theory, behavioural economics, experimental economics, etc.¹¹

(3) What, then, can we say about the reception of *Reflections* itself by economic methodologists? It can be argued that, since abandoning prescriptivist demarcationist methodologies, methodologists have generally been content to describe the methodological practices of economists with a minimum of evaluation (e.g. Morgan and Morrison 1999). Hands' book is likely to reinforce this arm's length posture, but it is also likely to raise concerns about reflexivity issues which Hands discusses but to which most methodologists have given limited consideration. We cannot predict how this will play out other than to say that there will likely be differences of opinion regarding the reflexive relation of methodologists to economics. This 'ambivalent' response within the community of methodologists might accordingly be said to constitute the structure within which transcendent reflexivity operates in recent economic methodology.

3.2 Symmetry

In our discussion of Hands, reflexivity has emerged as a crucial issue between economists and economic methodologists. To the extent that economic methodology naturalizes on economics, economists would become the economic agents of an economics of scientific knowledge. Yet, at the same time, economic methodologists would turn into economists. Reflexivity would thus emerge as an issue between economists and economic agents too, and it is here that one finds important links between economic methodology and recent economic theorizing in which this reflexivity has assumed centre stage. Sent gives these aspects full examination in her work. She looks at the development of Sargent's rational expectations economics simultaneously as an investigation of immanent reflexivity and as a self-conscious exercise in epistemic reflexivity. But she also considers a larger social context around her work, and thus opens the door to the possibility of transcendent

reflexive relationships. (1) The first level of investigation charts the evolution of Sargent's thinking regarding the relationship between economists and economic agents as he struggled to accommodate macroeconomic theory and econometric method to one another. (2) The second level of investigation reflexively implicates Sent herself in her investigation of Sargent. (3) The third level of investigation reflexively implicates Sent's own readers in her investigation of Sargent.

(1) Macroeconomics requires one to address the problem of prediction. If economists' theories generate predictions that affect the behaviour of economic agents, those theories may be either self-fulfilling or self-defeating depending on how behaviour is affected. For example, should economists predict certain effects of particular policy measures, but economic agents respond to those predictions in such a manner as to negate those effects, then there is an immanent reflexive relationship between economists and economic agents that defeats economists' predictions. For those theories to be sound, they evidently must avoid being self-undermining in this way. The question is whether immanent reflexivity, as such, should be regarded as problematic for economic theorizing, or whether some forms of immanent reflexivity are actually compatible with consistent theories of how economic agents behave. Sargent believed that assuming economic agents have rational expectations solved the problem of prediction, because economic agents' rational expectations are predictions of future events that coincide with the predictions of the correct economic theory. Boldly put, when economic agents use the theory that includes rational expectations, economists' predictions are fulfilled. In a sense, their theories have become self-validating in an immanently reflexive way.

But Sent points out that to demonstrate this claim Sargent had to employ an econometrics adequate to the modelling of economic behaviour. In short, he had to populate his models with agents that were themselves conceived of as econometricians, and to adopt a forecasting technique – engineering vector autoregressive model (VAR) – which ensured a tight conceptual link between economic theory and the forecasts of the agents thus modelled. Sent argues (using Pickering's (1995) concepts of resistances and forced moves) that Sargent failed to show that good dynamic economic theory corresponded to his good dynamic econometric theory. Thus, while Sargent was keen to establish what Sent calls 'symmetry' between economic agents and the theories that account for their behaviour, he continued to struggle with both the technical and the ontological constraints of this endeavour (cf. Sent 2001b).

(2) Sent points out that this immanent reflexivity problem which she identifies opens up a problem of symmetry between historians of economics and the economists they investigate that encompasses the reflexive relation-

ship between economists and economic agents (Sent 1998: 121–2). This more general problem can be stated as a dilemma:

If sociologists of scientific knowledge are *symmetric* with scientists, then, why should we take their word over that of scientists? If sociologists of scientific knowledge are *asymmetric* with scientists, then, what kinds of standards can they employ to establish their privileged position?

(Sent 1998: 122; emphasis added)

Hence, if Sent's word is not to be taken over Sargent's, she should refrain from making claims of inconsistency in his work. In this case, however, she wonders whether she has anything to offer beyond what Sargent says, both in conceptual and in historical terms. Alternatively, if Sent's word is taken over Sargent's, she must occupy some position removed from his, in which case, she insists, it is unclear which standards should decide why what she says should take precedence over Sargent's own claims. Sent, in posing these questions to the reader, consciously adds a dimension of epistemic reflexivity to her writings.

(3) But the problem, she goes on to say, does not stop there, since this problem of symmetry also applies to Sent's readers as evaluators of her text. If their opinions are not to be taken over Sent's, they have nothing to gain or offer in reading and commenting upon it. Alternatively, if their opinions derive from some position removed from hers, it is not clear they are in a position to comment on her text. She adds thus a transcendently reflexive account of her own work, by drawing the attention of the readers, as potential patrons of her text, to their own peculiar position.

How are we to look upon the appearance of reflexivity in these different manifestations? And in particular, how should we understand Sent's contribution, given that she has confronted us with these epistemically and transcendently reflexive dilemmas? Both dilemmas, formulated in the ways she formulates them, seem to undermine her contribution. The strategy offered in Sent (1998) is cast in terms of her own and the reader's epistemic reflexivity dilemma of needing to seize one or the other horn of the symmetry dilemma. Sent chooses to actually seize both horns of the dilemma, thereby involving her in adopting both symmetrical and asymmetrical views of her subject at the same time (*ibid.*: 121). On the one hand, she sees Sargent as re-writing his own history, and symmetrically asks, 'what prevents me from (re)writing his history?'. On the other hand, she sees doing this as a matter of not 'bowing to after-the-fact retrospective accounts given by [Sargent]', and thus asymmetrically distinguishes her own project from his.¹²

This 'dual' strategy of embracing the dilemma arguably disciplines and displaces the originally malign reflexivity issue by segregating our more disturbing concerns from our normal investigatory practice. Investigators

can continue their work in full knowledge of the potentially self-defeating arguments against their work if their accounts exhibit a plurality of voices and perspectives, leaving the reader not with contradictory messages but with a menu of potential perspectives that are in dialogue with each other.¹³

Note how the example of Sent illustrates the options available to an author in respect to epistemic and transcendent reflexivity, respectively. Authors wield substantial control on the epistemically reflexive dimension of their work, as they can redesign their own position towards and within their text at will. In contrast, the transcendentally reflexive dimension is removed from their immediate influence. All they can do is appeal to the patron space, but ultimately, they are at its mercy. Sent's menu of perspectives illustrates one form such an appeal may take. Another form can be found in Mäki's examination of the idea of a free market for scientific ideas, the transcendentally reflexive dimension of which has led him to co-sponsor an assertive intervention in this market.

3.3 THE PETITION

Mäki (1999) applies a 'reflexivity test' to the idea of an economics of economics. The increasing popularity of economic metaphors in science studies invites us to ask whether economics as a science can be explained and evaluated according to the concepts and reasoning of economics – or at least one version of economics. Mäki asks whether the object of investigation can be understood in terms of its own methods. His discussion focuses on the economics of Ronald Coase (see also Mäki 1998a, 1998b, 1998c). He asks whether Coase's methodological position can be explained and justified in terms of the economic approach he advocates for the analysis of markets and other institutions, which has become part of the new institutional economics and in which transaction cost arguments play a crucial role. Coase has been very critical of conventional economic analysis, condemning it as 'blackboard economics' with little resemblance to what happens in real world markets. Mäki calls this 'methodology as regulation', a prescriptive position with clear views of what makes for good and bad economic research. Mäki contrasts this position with the view that Coase (1982) takes in his criticism of Friedman's (1953) 'Methodology of positive economics', which amounts to a call for an economics of economics. Rather than engaging in methodology as regulation, Coase draws attention to how economists actually decide which of two competing theories to support.

Mäki (1998c: 250) calls this second position 'methodology as free market economics'. Rather than prescribing a particular approach, the methodologist should study the discipline of economics empirically and describe it in economic terms. As one would expect Coase to base this empirical analysis

on the same transaction cost reasoning that he has applied elsewhere, Mäki suggests that there may be a paradox in Coase's overall position, because blackboard economics may turn out to be the preferred kind of economics once transaction costs are taken into account.

In terms of our framework: (1) what Mäki suggests is an immanent reflexivity test, because, as in the case of Sargent's economics of rational expectations, here we are concerned with a theory of markets which can possibly apply to the context of its own creation and position in the market of ideas. (2) But this test also exhibits epistemic reflexivity in bringing the behaviour of Coase the theorist into the domain of explanation of his own theory of theory formation. Interestingly, this second dimension of reflexivity is also present, by inference, in Mäki's meta-analysis of Coase. In being the author of this 'reflexivity test' and evaluator of its results, Mäki's own methods of investigation are at issue. (3) Finally, the larger social context behind Mäki (1999) is 'The Petition', a document published in the *American Economic Review* of May 1992 with the signatures of a number of notable economists calling for economics to function according to the free market. Mäki's political participation and, indeed, co-initiation of 'The Petition' indicates a keen awareness of the transcendently reflexive issues opened up by his project.

(1) Mäki's (1999) reflexivity test asks Coase's free market economics of economics to address two problems: the problem of self-explanation and the problem of self-justification. Successfully doing so would mean that it satisfies 'the Consistency Supposition' that matches one's object-economics and one's meta-economics. Thus consistency becomes a solution to the (immanent) reflexivity test, much as Sargent saw rational expectations as a solution to his own (immanent) reflexivity test. Mäki argues, however, that Coase fails this test in connection with the second of his two problems, because he resorts to his regulationist criticism of blackboard economics to justify and defend his transactions cost framework. Here, we have immanent reflexivity exposed not as a neglected issue that, once explicitly addressed, leads to a consistent account. Rather, due to immanent reflexivity between Coase's object and meta-economics, the two contradict each other. The reflexivity becomes self-defeating and the charge would have to be countered either by revising the economic and/or meta-economic analysis, or by arguing against the relevance of immanent reflexivity in this instance. However, Coase's failure to see the problem posed by immanent reflexivity points to a lack of an epistemically reflexive dimension in his work as, according to Mäki, he should have realized that his free market economics should also apply to his recommendations for the market of ideas.

(2) But this need not imply that other versions of an economics of economics also fail to live up to the standards of their own methods. The larger objective

of Mäki (1999) is to scrutinize Coase's failings in terms of fundamental ambiguities associated with determining the domain of economics. In a climate of economic expansionism, the identity of economics as a discipline has been neglected. Coase employs the measuring rod of money to define economics' domain, but Mäki argues that there are problems in doing so. He adds, nonetheless, that 'we are not yet in the position to pass the final verdict on these matters', because of the high degree of ambiguity involved in the terms by which the Consistency Supposition was formulated – 'regulation', 'market', 'free' (Mäki 1999: 503). Thus, the status of the reflexivity test itself remains unsettled and its author (Mäki) remains in reflexive relation to his object, awaiting further clarification of these concepts from the actors of his domain of investigation.

(3) Finally, we turn to 'The Petition'. Mäki points out that among its signatories were individuals not particularly supportive of the idea that economics function in free market terms. At the same time, there were also individuals who supported the idea but, for one reason or another, chose not to add their signatures. Both might be said to be ironically engaged: supporting and not supporting something at the same time, as supporting an intervention in the market of ideas calling for a free market of ideas may itself be interpreted as being conceptually in conflict with the idea of a free market of ideas. Hence, paradoxically, both supporters and opponents of the *status quo* may have felt it appropriate to sign 'The Petition'. We believe this reflects the greater complexity of considerations operating in the large social context. In particular, we find an intriguing occurrence of immanent reflexivity within the transcendently reflexive dimension opened up by 'The Petition'. While some might be tempted to argue that these two groups of individuals immanent reflexively undermine themselves by the positions they have taken, the act of having the petition signed and publicized is consistent in its transcendent reflexivity. As in Sent's case, how we respond to reflexivity ends up depending on a variety of additional factors that explain how reflexive relationships are socially embedded.

3.4 The 'Colonel's dilemma'

The ambivalent immanent reflexivity opened up by 'The Petition' on the transcendently reflexive level of Mäki's analysis is closely related to the strategic nature of the signals embodied by the act of supporting it or not. It is this strategic dimension to which we now return in our final example of reflexivity in economic methodology. We focus on an early episode in the history of the development of game theory that Mirowski describes as the 'Colonel's dilemma' (Mirowski 2002: 320ff). 'The enigma, almost a paradox, was, What should the military do, if it really believed game theory a serious contender as a rational theory of conflict?' (ibid.: 325).

The traditional view was that ‘just like any other cutting-edge secret weapon ... keep the maximum of details secret for as long as possible’ (ibid.). This view was reinforced by one of the principal stratagems of game theory – bluff, evasion and deception – which was achievable through a randomization of strategy. It implied that the military should give the appearance of being simultaneously interested *and* uninterested in game theory, of believing that game theory was both true *and* false. On the one hand, this meant that even one’s own researchers, citizens and allies would need to be misled as to game theory’s possible importance. On the other hand, if one believed game theory was the essence of strategic rationality, then

if the opponent was effectively kept in the dark concerning the contents of the relevant strategy set, and ... had no solid idea about what game it was engaged in playing, then game theory as a formal structure was intrinsically irrelevant to the rivalry.

(ibid.: 326)

Thus, one also needed to signal that game theory was important.

Mirowski argues that this ‘house of mirrors’ had a chilling effect on RAND researchers in game theory, because they could never sort out how to position themselves in this paradoxical situation. The published literature had to be thought untrustworthy but, if one tried to correct it, one only revealed one ‘naively misunderstood the role of game theory in a strategic environment’ (ibid.: 326, 327). Ironically, game theory still seemed to be important. Mirowski illustrates all this in detail through the story of Colonel Oliver Haywood. Our goal here, however, is to merely explore what this general account adds to our understanding of reflexivity.

(1) The ‘Colonel’s dilemma’ is an example of immanent reflexivity, because game theory is applied to itself. On the one hand, this actually realized one conceivable scenario of economic methodology naturalizing on economics, as envisaged by Hands, in that game theory would provide the foundation for an economics of economics. On the other hand, however, reflexivity does not stop there. The fact that researchers at RAND and elsewhere had their actions reflected back upon themselves as actors in the very games they were producing added to this a dimension of epistemic reflexivity. The RAND researchers realized that they themselves appeared in their models. They did not simply work within a framework in which economic research was subject to its own results as part of a sub-disciplinary division of labour. More worryingly, game theory seemed to apply to itself, with the validity of some propositions deriving from a strategic approach to the development of its content in the first place. As a result, game theorists were very aware of their own presence in their theorizing. Game theorists

saw themselves looking at themselves in an epistemically reflexive relationship. That the 'house of mirrors' character of the situation, moreover, had a chilling effect on game theory research indicates that reflexivity at this level was self-defeating: research in game theory was blocked by an 'enigma' at its core. If it is unclear whether a contribution to game theory is a signal in the game for which the theory is being developed, the status of that contribution to the theory is inherently ambiguous. This outcome reminds one of the conundrum associated with 'The Petition'. In both cases, the origin of the ambiguity rests in part on the patron space and awareness of this exhibits transcendent reflexivity.

(2) But, given this story, how are we to look upon Mirowski's telling of it? If the 'Colonel's dilemma' disabled RAND game theory researchers, doesn't it also disable Mirowski's story? Why should Mirowski be any more correct about the status of Cold War game theory than were the researchers of the time? If he is symmetrical to them, then he can have no more confidence about the importance of game theory at the time than they did. If he is asymmetrical to them, then his having a privileged view of the matter needs to be explained. Thus the story of the 'Colonel's dilemma' itself calls for epistemic reflexivity to be acknowledged.

(3) We think, however, that transcendent reflexivity associated with Mirowski's own account comes into play here. One thing that can be said about *Machine Dreams* is that it exposes and reveals a hidden history and, thereby, has particular effects on the history it describes. *Machine Dreams* aims not just to recover the historical record but, because the historical record lies largely in classified documents and, more crucially, is subject to the fundamental ambiguity described above, it aims to generate debate over, and investigation into, that historical record. Like *Las Meñimas*, we thus treat *Machine Dreams* as furnishing the patron space surrounding the immanent and epistemic reflexive relationships exhibited by the 'Colonel's dilemma'. We, as readers of *Machine Dreams*, are intrinsic to this potential process of the creation of history where none could have been recovered from the archive.

4 CONCLUSION: THE CHARGE RECONSIDERED

The claim that reflexivity inevitably undermines social science or at least SSK (cf. Goldman, Woolgar above) can be evaluated from the perspective of how reflexivity is addressed in economic methodology. What we have tried to show in the previous section is that reflexivity relationships operate on different levels and are often nested in one another. Reflexivity, then, can indeed be destructive or self-defeating at one level, but moving to a different level introduces new forms of reflexivity that encompass the earlier

ones that may or may not preserve the earlier forms' characteristics. Consider Sent's treatment of Sargent's work. Sargent sought to avoid the self-defeating character of his investigations by re-writing his own history. But, as a historian, Sent rivals Sargent as an observer on Sargent's history. Is Sargent's dilemma, then, transferred to Sent in the form of a self-defeating, epistemic reflexivity in her book? We have argued that this is not the case, because Sent is explicit about her orientation toward Sargent, while Sargent is not explicit about his orientation toward himself. Sent's epistemically reflexive relationship to Sargent and rational expectations macroeconomics loses its self-defeating nature due to her open commitment to pluralism: that one can embrace both sides of a dilemma, which is indeed one way of dismissing a dilemma. We, thus, put aside for the moment whether it is a viable strategy to simply emphasize its character as a particular approach to epistemic reflexivity. Rather than transfer the self-defeating character of Sargent's immanent reflexivity to the epistemic level, Sent identifies her own relation to her text and uses that as a firewall against her text being self-defeating. Here, then, immanent reflexivity is nested in epistemic reflexivity in such a way as to escape the more serious consequences of the former.¹⁴

But neither Sent nor Hands create arguments that have a transcendently reflexive character, although their work can be interpreted to exhibit such reflexivity. In this larger social-historical exterior surrounding the observer-subject relationship, such as we have described in connection with *Machine Dreams*, the fate of the reflexive relationships at the core of the story is contingent upon the impact of the book itself. Just as *Las Meñinas* has acquired a history through its 'readings' by Foucault and others, so *Machine Dreams* will acquire a history through its subsequent readings. The same, of course, can be said for the texts of Sent and Hands, but there is a difference in Mirowski's case due to the centrality of deception in the original immanently reflexive 'Colonel's dilemma'. Essentially, telling a story of deception alters that deception's status. This is not to say it removes that deception. The problem of how to judge game theory continues to bedevil post-RAND game theory researchers (the immanent reflexivity) and still underlies Mirowski's own account (epistemic reflexivity). But, exposing the 'Colonel's dilemma', through the publication of *Machine Dreams*, enlarges the ranks of commentators and observers and makes this deception an object in ways that it was not in the earlier 1950s history of the development of game theory. Post-publication of *Machine Dreams*, how the original immanently reflexive 'Colonel's dilemma' plays out at the epistemic level is contingent upon emergent phenomena surrounding the general uptake on the book. Following our discussion of *Las Meñinas*, we characterize this as an expansion in patronage, that is, an increase in the numbers of those with a stake in the original dilemma who are prepared to re-tell Mirowski's story. Like Velázquez's painting, Mirowski's text will follow a history beyond its

producer's ambitions. This larger social–historical space retains (transcendent) reflexive characteristics because commentary on the game theory story of *Machine Dreams* feeds back upon both the interpretation of the original immanently reflexive relationship and upon its author's epistemically reflexive relationship to it. Transcendent reflexivity thus encompasses immanent and epistemic reflexivity. But whether the 'dilemmas' at these earlier levels are also communicated to this last level cannot be determined in advance. The fate of game theory remains emergent upon the social history of its patrons.

Given our discussion of reflexivity in economic methodology, where do we stand with respect to the charge of self-defeating immanent reflexivity against SSK in the Edinburgh School and, hence, against economic methodology naturalized in the same vein on economics? Let us first consider whether SSK is epistemically reflexive

Our everyday attitudes are practical and evaluative, and evaluations are by their nature asymmetrical. (. . .) The symmetry requirement is the call to overcome these tendencies [I]t does require us to reconstruct the local social background to which our curiosity is adapted. We can do this by creating new, specialist groups with their own taken-for-granted, professional perspective.

(Bloor 1991: 176–7)

Bloor salvages symmetry by drawing a distinction between 'methodological symmetry' on the one hand, and psychological and logical asymmetry on the other. Imagine an anthropologist studying witchcraft. Does the symmetry postulate compel this researcher to believe in witchcraft in order to achieve Sent's symmetry? Suppose he remains asymmetrical in this respect. Quite independent from whether or not he is himself committed to the existence of witches, his task is still to explain whether or not the actors under study believe the world contains witches. Methodological symmetry compels him to regard both the true and false (from his perspective) options as equally problematic. He might be predisposed to only see the false option as problematic, but professional ethos should counter-balance this tendency to kindle his curiosity to also investigate belief formation should the actors under study share his witchcraft scepticism.

SSK, according to the Edinburgh School, confronts thus both immanent and epistemic reflexivity explicitly. But this leaves Goldman's charge intact. If SSK claims scientific knowledge is socially constituted, this would also be the case for SSK claims themselves. So why should we accept these claims as true? The answers provided in the work of the methodologists we have discussed above point the way. The malign dimension of immanent reflexivity present in the various naturalizing moves within economic methodology turns into a benign form once both epistemic and transcendent reflexivity are adequately addressed. As the range of reviewed responses indicates, there is more than one possible strategy to respond to the various

dimensions of reflexivity. One can embrace the dilemma like Sent, turn it into a social experiment like Mäki, or weave it implicitly into one's substantive comments like Mirowski. One may even appeal to the division of labour by encouraging others to examine the epistemic and transcendent dimensions of one's immanently reflexive arguments, as we have done in the present contribution. Patronage will determine whether our arguments are accepted as true or not and our readers may play an active part as sponsors. Goldman's charge of immanent, Liar-type, self-refuting reflexivity fails, then, because he judges SSK and the projects that it has inspired and encouraged in other fields, including economic methodology, on the basis of a definition of knowledge which transcends the patron space.

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NOTES

- 1 There is a third connotation related to the concept of a biological 'reflex', which arguably has led to an ambiguous characterization by Giddens (1976: 84; 1979: 128) of what he calls the 'reflexive' monitoring of social conduct (cf. Holmwood and Alexander 1991: 95–101).
- 2 The function faculty is defined as $\text{fact}(n) = n \text{ fact}(n - 1)$ with $\text{fact}(0) = 1$, $n \geq 0$.
- 3 *Drawing Hands* depicts two hands which plastically emerge from a flat piece of paper where their pencil contours are being drawn by each other.
- 4 Our concern is thus not to engage with reflexivity in set theoretical terms nor from the perspective of logical semantics, which allows us to disregard more technical aspects such as total versus partial self-reference (cf. Whewell 1987).
- 5 *Las Meñinas* has been subject to an extensive secondary literature. Foucault's discussion, though perceptive, glosses over a number of controversial details, including the status of the reflection in the mirror which may be either reflecting what is painted on the canvas or the exterior of the actual painting itself. The traditional 'literal' reading identifies the contours in the mirror as those of the royal couple. According to a different reading, Velázquez is playing on the vagueness of the reflection (cf. Hurley 1986; Foti 1996).
- 6 Our extraction of several types of reflexivity from the painting is not intended to be exhaustive either of the painting itself or of the concept of reflexivity in general.

- 7 In *Las Meñinas*, past and present patron space coincide representationally. In a conventional portrait, the space of the patron sponsoring the painting originally would be 'behind' the canvas.
- 8 The ambivalence of 'transcendence' in this context is intended, drawing from Bloor's (1974, 1991) sociological interpretation of Popper's (1972) 'third world'.
- 9 'Affected' here refers to more than the readily granted proposal (e.g. Collin 1997) that the pursuit of science is a social activity.
- 10 Rorty (1979) offers an influential critique of philosophy as the foundational queen of the sciences.
- 11 Since heterodox economics is arguably prescriptive at this broad level, it would fall beyond the pale.
- 12 Similarly, 'historians of economics cannot wash their hands of contemporary developments in economics and let economists write their own histories' (Sent 2002: 315).
- 13 The strategy thus resembles the way in which Bertrand Russell's theory of types dealt with the contradictory nature of his self-referential 'set of all sets not members of themselves'. By creating different levels of investigation, Russell was able to sustain his set-theoretic reduction of mathematics to logic by controlling the scope or space in which certain problematic issues might arise. In a later paper (Sent 2001a) this strategy is replaced by another, namely, one in which Sent organizes her discussion of her subject matter – Herbert Simon – according to principles she finds in his work.
- 14 A similar argument can be made regarding Hands' case, only he sees seizing one horn of the dilemma as non-problematic, with consequences we can live with.

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