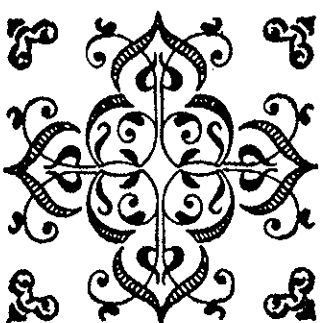


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ordinary, surprising or even shocking. That the earth moves, that we live on after death, that we are descended from monkeys, that heretics should be tolerated, that atoms can be divided, that we do not live on after death, that humans can travel to the moon, that the lives of savages matter, that famine relief can make matters worse – such things as these have often been found outrageous and yet their espousal has not betokened irrationalism. Moreover, since familiar beliefs are often reflected in ordinary ways of talking, thinkers whose enquiries lead them to challenge such beliefs may also find it hard to avoid having recourse to extraordinary ways of talking. Merely to show that Popper's proposals are surprising and his use of certain words is extraordinary does not suffice to establish that the proposals are irrationalist and that the ways of talking are devices for securing acquiescence. The proposals would be manifestations of irrationalism if they stemmed from an insistence on thinking with the blood or on believing things because they are absurd or on blowing raspberries instead of reasoning or from something of that sort. It is contentious to call them irrationalist just on the strength of their surprisingness.

Stove seems to take the thesis that Popper's philosophy is irrationalist to be sufficiently established by the point, made right at the beginning of the book, that any views which commit their adherent to denying that we know more now than we did 50 or 200 years ago are irrationalist. In deciding what weight to give to this the reader should recall that, while Popper does indeed maintain that there are no positive reasons to believe scientific theories, it is also central to Popper's theory that we can have reason to prefer one theory as a candidate for truth to another. An adherent of Popper's views expects that the following can be shown: more recent scientific theories are to be preferred to less recent ones by reference to methodological rules which are such that theory-choice guided by them is highly responsive to empirical experience. Now it is not obvious that this cannot be shown, and it is not obvious that Stove's bold claim that we know more than we used to is not just an incautious exaggeration of the claim that there is reason to prefer the theories we now have to the ones we used to have.

The contentious thesis that Popper's philosophy is irrationalist is what holds the book together. On it depends the presumption in favour of an explanation of the kind Stove offers for the non-derisive reception of anti-inductivist ideas. In the absence of such a presumption, other possible explanations need to be at least noticed. Perhaps, rather than just being deceived, people found Popper's proposals and his arguments in defence of them challenging or stimulating or promising. Perhaps the possibility of accounting for the (no doubt imperfectly) rational development of science without recourse to induction has seemed worth exploring, because an inductivist and belief-oriented approach has not been so overwhelmingly successful as to render pointless the consideration of another approach. Perhaps sympathetic consideration and even espousal of deductivism have been prompted by the thought that any given finite collection of empirical data will fit equally well any one of infinitely many different theories and hence cannot give grounds for believing one of them rather than the others.

Although criticism – as opposed to explanation – was not Stove's main purpose, much of the book is given over to what appear to be debating points scored by taking uncharitable interpretations of selected passages. This creates an impression of superficiality. No doubt some of the examples are real bad habits, lapses of style or lapses in rigour; but others are closely connected with philosophical positions, and there it is inappropriate to be distressed by the prose manifestation instead of focusing attention on the philosophy and taking issue with that. In the admirable chapter on Humean inductive scepticism, Stove does focus attention on the philosophy. Similar attention to other aspects of Popper's philosophy – the decisionist, conventionalist and epistemology-without-belief tendencies – would have been welcome, but there Stove sticks to the symptoms.

So the dual explanatory task of this book is not successfully carried out. But Stove has made an enthusiastic and vigorous assault on mannered writing and issue-fudging, and this is very salutary. While one could wish him to be more charitable and even indulgent in seeking out Popper's meaning, reading him may produce twinges of conscience and prompt a good resolution: not to make excessive demands on the interpretative charity of others.

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8. *Husserl and Realism in Logic and Mathematics*. By Robert S Tragesser. Cambridge University Press, 1984. Pp. xvii + 126. £17.50.

The theory of intentionality, which is often seen as the central tenet of phenomenology, can be interpreted either in a realist or in an anti-realist manner. Considerable confusion exists as to whether the noema grasped in the intentional act is the objective thing itself or whether it is an 'ideal' meaning akin to Frege's *Sinn* which includes some kind of reference to the thing. It is extraordinarily difficult to develop this debate due to the inadequacy of our conceptual inheritance in the English language. Husserl, on the other hand, as Farber points out in his fine study *The Foundation of Phenomenology* (1943),¹ was very much at home in the art of making fine distinctions, something of which we are largely incapable due to the flattening of concepts of reason in our day. Husserl could give us finely shaded distinctions between 'real', 'actual', 'objective', 'existent', etc. Thus any study of phenomenology which seeks to translate Husserl's insights into the language of analytic philosophy has to be very careful that it is not losing a great deal in dislocating concepts from the complex theoretical home.

Tragesser seems to be quite aware of these difficulties and this short book is actually quite an informative and reliable guide to Husserl's thinking on the noema, particularly with reference to mathematical objects. The scope of the book is very narrow. Beginning with the recent discussions of realism and anti-realism in the work of Michael Dummett, Tragesser is interested in using the work of Husserl to explore the question of the rela-

tion of thought to truth, a relation which invokes the question of the validity of the Law of the Excluded Middle. The common link between Dummett and Husserl here is of course the philosophy of Frege and in particular his essay, 'Thoughts', which argues for a third domain between our ideas and reality, the world of timeless thoughts, capable of truth or falsity. Tragesser wants to explore the problem of realism and in particular the problem of the reality of mathematical entities (e.g. numbers) through a consideration of acts of thinking. His model for acts of thinking is the model Husserl developed and Tragesser sees himself as exploring this domain in a non-dogmatic way, learning from Husserl but not bound totally to him.

Husserl's own career began with the problem of the foundation of arithmetic and logic, and this problematic continued through the *Formal and Transcendental Logic* up to the late 'Origin of Geometry'. He began as a student of Weierstrass, who was interested in refining the infinitesimal calculus; and continued his meditation on the nature of arithmetic under the influence of Brentano. Two works *Concerning the Concept of Number* (1887) and *The Philosophy of Arithmetic* (1891) from Husserl's earliest period both attempt to investigate number through acts of thinking. In these works Husserl believed that all mathematics could be reduced to the question of number and that numbers could be explained in terms of the psychological acts of representing pluralities or collectives to ourselves. We understand number if we understand what takes place in counting; we understand counting by *reflecting* on it. As Husserl states in both works: 'The collective connecting can only be grasped by reflecting on the psychic act through which the aggregate comes into being'. This approach has widely been seen (by Frege and Husserl himself in due course) as dangerously psychologistic, yet Husserl's phenomenology can be seen as developing from this starting point, namely, that reflecting on intentional psychic acts produces essential truth.

The standard lore is that Husserl renounced his psychologism due to the influence of Frege's review of his *Philosophy of Arithmetic* published in 1894. Frege criticised Husserl's whole approach but also made several specific criticisms – pointing out for example that seeing numbers as derived from the concept of a collectivity could not explain how the number 'one' or 'zero' is derived. Husserl had sought to treat these as negative answers to questions about plurality and Frege ridicules this by saying that the answer to the question, 'How many moons has the earth?' can hardly be construed as a negative answer. Frege further pointed out the difficulty of treating numbers in terms of intuition – how could transfinite numbers ever be capable of being intuited?

Husserl had already seen most of these shortcomings in his own early formulations of the problem and had already turned to the study of Bolzano, Lotze and Meinong among others – as indicated by his published surveys of logical literature in the early 1890s – so the intervention of Frege may not have been as decisive as the standard view (influenced no doubt by the enormous impact of Frege in logic subsequently) maintains. Indeed a letter from Husserl to Carl Stumpf dated 13 February 1890 indicates that Husserl already realised he could not deduce the 'negative, rational, irra-

tional and various complex numbers from the concept of number. Instead Husserl turned to the study of ideal meanings and the problem of constituting objectively valid meanings in thought.

Bolzano and Lotze had already tried to develop a theory of ideal meanings as Platonic entities, propositions-in-themselves independent of our thinking. Husserl wished to get at these things themselves but not through imposing speculative metaphysical notions. Indeed he believed that both psychology and metaphysics were operating with misleading accounts of how thinking constituted objective meaning. Husserl turned to a critical rethinking of Brentano's concept of intentionality, purging it of psychological notions such as the distinction between 'physical' and 'psychological' and developing instead a theory of noetic acts with their correlated noemata. Husserl very quickly realised that talk of 'intentional inexistence', 'immanent objectivity', 'content' and so on was open to naturalistic misconstruction.

Tragesser begins at this point – with the theory of the noema. In fact he goes so far as to claim that 'phenomenology in the strictest sense is the theory of noemata' (36). Tragesser is uninterested in the framework of the reductions and of the transcendental ego, instead he concentrates on the manner in which noemata are posited and validated. Husserl from the *Logical Investigations* onwards had been developing a theory of the constituting and fulfilling conditions in the positing of a noema. Tragesser sees Husserl as arguing that when an object is given in consciousness (phenomenology of course treats it as a 'purported object' – 19), then given with it are the rules by which this object can be thought about. He states that as: 'no entity (for us) antecedently to a way of thinking and to thinking in that way' (113). Thus a noema is not just a meaning, or a *Sinn* in Frege's use; it is a complex object which holds within itself all possible pathways to the object as can be given through thinking. This is important. Several recent analytic philosophers have identified noema with 'sense', but Tragesser points out the noema is not reducible to sense as it also lays the foundation for our principles of reasoning about the object. Even in Frege, as Dummett points out, sentential senses somehow lay out a pathway to their reference. Husserl is attempting to explicate the steps on this pathway.

The noema then is everything for Tragesser (this is unfortunate as he has totally ignored the huge problem of the variety of acts through which noema can be grasped) and it actually prescribes the conditions of its own validation. It is questionable therefore whether the law of the excluded middle which demands of all propositions that they be either true or false is applicable to the kind of presentation given in the noema. For Husserl formal logic operates with a hidden 'formal ontology', but the noema conceals in itself the possibility of alternative and even contradictory ways of reasoning about it, depending on the 'world' that is given with it. I understand this to mean that formal logic which believes itself to be context-free is in fact working within an assumed context but one which it has not made explicit to itself (Heidegger develops this in *Being and Time*). Further, it is not a question of thinking about a meaning against the background of a context, the meaning as posited constitutes the context as well, or possibly a range of contexts. Just as in reading a book we can hold the con-

text in mind as we move from one page to the next, Tragesser says, so too the noema carries along with it a context which may not be fully filled out. For Tragesser it is possible to see the problem of the reality of the noematic 'object' as a problem of how this context can be fully filled out. Husserl's criterion was, according to Tragesser, our ability to continue framing mutually consistent sentences about the posited object, sentences which are fully justified and validated with respect to the means offered by the noema itself.

This means that Husserl has abolished the appeal to an absolute viewpoint which would allow us to peek over our phenomenological acts to grasp the thing itself independently and thus compare our thoughts with the real thing. The only reality is the reality of fulfilled thoughts. These thoughts have to be *mutually consistent* in Tragesser's analysis. Meinong's square circles run aground as real objects because we cannot continue to frame sentences after a certain point.

One of the most interesting aspects of Tragesser's book is his discussion of a visual illusion – the Frazer spirals – and his development of the problem of intuitions in geometry.

The Frazer spirals are a system of concentric circles drawn on a chequered-squared background which present themselves to the eye as a continuous spiral. Even when we know they are circles we cannot escape the illusion that they are a spiral. Considering this as a presentation it is clear that implicit in our illusion is our reliance on only one validating procedure, namely looking at the page which forces us to conclude that we see a spiral. However if we run our fingers around the 'spiral' we realise it is actually a set of circles. Thus running my finger around the circles is another validating procedure initially obscured but which can be quickly brought to light. We can think of the noema as containing both sets of validating procedures (and possibly others) implicit in itself. We are caught in the illusion because we have not phenomenologically clarified our validating procedures but merely proceeded with the validating procedure most commonly used in the natural attitude. This I take to be Tragesser's meaning but his discussion is over intricate and inconclusive.

Turning from the Frazer spirals to the question of geometrical intuitions, Tragesser makes allusion to Husserl's late essay, 'The Origin of Geometry'. This essay has been edited and translated by Jacques Derrida and is becoming more influential in recent philosophy as a result. Tragesser prefers to proceed from his own examples – the construction of various geometric bodies by applying sets of rules, given a 'ground figure', in this case a paper square. His point – again obscured by needless complexity and the introduction of Klein bottles and projective squares – is that different geometries can be got depending on the 'validating rules' we apply to the objects given in intuition.

Thus Euclidean geometry treats of the ideal triangle and ignores (methodically and deliberately) any violations of the ideal caused by our drawn versions of triangles. However it is also possible to develop – as Hjelmslev did in 1923 – a geometry of drawn figures, which yields different results, e.g. that the angles at the base of an isosceles triangle need not be equal. The advantage of Husserl's account of the noema is that it allows

us to treat the noema as being a repository of both the Euclidean and the Hjelmslevian geometries – they invoke different validating rules and are part of different frameworks or worlds. In the later Husserl all worlds must be thought in reference to the *Lebenswelt* but it is at least true to hold that all objects can only be thought in and through their world.

Returning to the problem of realism what is Tragesser saying? In his final summing up he suggests that the problem of realism and anti-realism particularly with reference to mathematical objects may cease to be relevant or significant. With the rise of intuitionist mathematics and Brouwer's work, the Law of the Excluded Middle is seen as restrictive and not valid. The mathematical imagination as Tragesser calls it need not be restricted within the bounds of classical logic. He feels Husserl's analysis of the noema allows us room to develop alternative mathematical systems – since the noema carries with it its own validation rules. However, Tragesser admits, the ontological question of realism remains in particular with reference to the relation between all kinds of mathematical entities and the lived world.

Tragesser's book is disappointing in its conclusions. It has used a very delicate analysis to yield no genuine results at all. The book is useful on Husserl and perhaps for showing Husserl's relevance in contemporary analytic philosophy but it has not achieved what it set out to do: namely, to carry a Husserlian-type analysis through to yield a new understanding of the problem of the reality of mathematical entities. This is because the author stops short of developing an analysis of horizons and worlds which was at the core of Husserl's remarkable discoveries.

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1. Martin Farber, *The Foundation of Phenomenology* (New York, SUNY Press, 1943).
2. Michael Dummett, 'Realism' in *Truth and Other Enigmas* (London, 1978) 145-165.
3. G. Frege, 'Thoughts', in *Logical Investigations*, trans. P Geach and R T Stoothoff (Oxford, 1977) 1-30.
4. See the excellent essay by Walter Biemel, 'The Decisive Phases in the Development of Husserl's Philosophy' in *The Phenomenology of Husserl. Selected Critical Readings*, ed. by R O Elveton (Chicago, 1970), 148-173.
5. *Ibid.* 152.
6. *Ibid.* 154— See also Farber *op. cit.* 54-60.
7. See R McIntyre and D Smith, 'Husserl's identification of meaning and noema', *The Monist* Vol. 59 (1975) 115-133; D. Follesdal, 'Phenomenology for analytic philosophers' in *Philosophy in Scandinavia*, ed. R. Olsen and A Paul (Baltimore, 1972) 417-429.
8. Tragesser, 31.
9. Edmund Husserl, 'The Origin of Geometry', trans. by David Carr, in Appendix VI of *The Crisis of European Sciences* (Evanston: North-western UP, 1970); J. Derrida (ed. and trans.) *L'Origine de la géométrie* (Paris: Presses Universitaires de France, 1962).
10. J. Hjelmslev, 'Die Natürliche Geometrie', *Hamburger Mathematische Einzelschriften* part 1 (1923) 1-36.