

## BOOK REVIEWS

Helena Eilstein (ed.), *A Collection of Polish Works on Philosophical Problems of Time and Spacetime*, Kluwer Academic Publishers, Dordrecht, 2002, viii + 148 pp., Euro 60 (cloth), ISBN 1402006705.

This volume collects eight articles in English by Polish authors in philosophy of time and of spacetime. The main emphasis is on the debate regarding the objectivity of the flow of time. According to the preface, the first six papers approach the topic from the vantage points of classical, relativistic, and contemporary physics. While the sixth paper of the collection, by the editor herself, only contains one section which can reasonably be imputed to philosophy of physics, it nevertheless connects to the previous five articles. Unfortunately, the same cannot be said of the last two papers, which seem to engage in rather different debates and to partake in entirely distinct traditions. The seventh paper by Stefan Snihur, composed in the vein of traditional philosophy employing the methods of classical logic, operates against the background of everyday experience rather than of physical sciences. The final paper by Andrzej Póltawski exposes the philosophy of time of the Polish Husserl disciple Roman Ingarden. The inclusion of these two papers threatens the coherence of the volume. To be sure, the fact that its authors are all Polish may bestow a unifying theme on the collection, but at the same time, it just shows how variegated the landscape of Polish philosophy actually is. Perhaps a substantial introduction embedding the papers in a larger context and relating them to each other could have established such coherence and offered motivation for the choice of the included essays. Also, the collection would have benefited from more careful editing and referencing and some of the essays could have profited from clearer English. Be this as it may, the volume provides the much-needed and appreciated service of making the contributions of contemporary Polish philosophers to the problem of time more widely accessible. For this, the editor and the publisher deserve the gratitude of the philosophical community.

In the first essay of the collection, Jerzy Golosz defines absolute *vis-à-vis* relational conceptions of motion and links the controversy between



absolutists and relationists to the problem of what spacetime symmetries an adequate theory of motion should exhibit. His effort focuses on both pre-relativistic, classical physics as well as relativistic theories. In the section on classical physics, which presents itself as a rather adventurous back and forth between a contemporary discussion of spacetime symmetries and historical citations and claims, Golosz criticises Newton's heirs for considering it sufficient to reject Newton's distinguished reference frame in order to renounce the absoluteness of motion. Instead, he complains, they should have established the viability of relationism by constructing a relational theory of motion. Golosz further claims that Einstein's special theory of relativity (STR) must be interpreted as an absolute theory of motion, mainly due to the fact that the metric tensor in STR is an absolute object, i.e. it is not affected by interactions admitted by the theory. He attacks Earman's (1989) conclusion that no theory with a relativistic structure can offer a relational account of rotation on the grounds that a relativistic spacetime may not have the structure of a spacetime of general theory of relativity (GTR). But if there is one spacetime feature required to qualify as relativistic, then the causal structure as encoded in the light cone structure or an equivalent property has arguably the best claim. Since Earman's conclusion rests solely on this feature, Golosz's complaint is misguided. He also wants to argue that the absoluteness of motion, which seems to be present in most if not all theories of motion, implies the substantial character of space or spacetime. According to him, Earman's attempts to offer a *via media* between the Scylla of relationism and the Charybdis of substantivalism have failed. He finishes by claiming to have proved that a theory which would realise Earman's representational ploy cannot exist. Unfortunately, his argument – which should have been made the main focus of the paper – remains rather superficial and thus failed to convince this reader.

In his 'Quantum Spacetime and the Problem of Time in Quantum Gravity', Leszek M. Sokolowski addresses two main aims: to motivate the quantisation of gravity and to discuss difficulties which arise from this quantisation, mostly regarding space and time. What is rather strange about Sokolowski's paper is that it does not contain any references at all, omitting for example a reference to the pertinent Huggett and Callender (2001) in the first section where he discusses the physicists' motivations for attempting to quantise gravity. Having said that, Sokolowski offers an insightful and scientifically informed article. He motivates the ambition for quantising gravity with the deeply-felt unity of nature and quickly proceeds to the resulting difficulties emerging from incompatible conceptions of time and space in quantum theory and classical gravitational physics.

After a splendid exposition of time in GTR and in quantum theory, he characterises the problem of time in quantum gravity. Due to its quantum nature, it requires a universal physical time conceived of as an external parameter. But as a theory of gravity, time as a geometric aspect of gravity should be considered as a local dynamical variable to be quantised. When the author, in the light of this dilemma, expresses pessimism regarding the extant characterisations of quantum spacetime and discusses Wheeler's fluctuation-of-topology approach, it is curious that he ignores loop quantum gravity, which, in some sense at least, represents a theory in Wheeler's vein and offers promising new developments towards resolving the issue.

Next, Michal Heller ('Time and Physics – A Noncommutative Revolution') explores the implications of the general mathematical tool of noncommutative (NC) geometry for the debate on time and change. Defending the thesis that real progress regarding the problem of time is always associated with a corresponding advance in the application of elegant mathematical tools in natural sciences, he draws the reader's attention to a relatively new mathematical structure, NC geometry. Define a linebreak differentiable manifold as the pair  $(M, C)$ , where  $M$  is a non-empty set and  $C$  is the algebra of the family of all smooth functions on  $M$ . NC geometry then emerges if one considers a noncommutative algebra instead of a commutative one. If fundamental physics is modelled on an NC geometry, time and space, and with them motion as traditionally conceived of, vanish at the scale of fundamental physics. The reason for this distressing disappearance stems from the fact that NC geometry disallows any local concepts such as points and neighbourhoods in favour of purely global ones. Resisting the temptation of invoking the full mathematical apparatus, Heller skillfully explains how one can nevertheless construct authentic dynamics from global concepts alone. This is done by starting out from the global properties of vector fields and deriving an algebra by recasting these properties in a delocalised NC setting. The dynamics are then encoded in mappings from one NC algebra unto itself which satisfies linearity and the Leibniz product rule. More specifically, the dynamics in the NC geometry assumes the form of a set of equations describing the evolution of the system at stake. Time, or an ersatz thereof, then re-emerges as a parameter with respect to which this evolution occurs. This 'noncommutative revolution' also involves a generalisation of the concepts of causation and chance. Perhaps shockingly to many philosophers of science, regularity theories of causation, depending as they do on an identification of individual events, are precluded in fundamental physics based on NC geometry. Thus, Heller concludes, we are well advised to conceive

of causation as a dynamical nexus rather than as the distinct events of cause and effect and their temporal order.

Jan Czerniawski then argues in favour of the flow of time as a selection rule in GTR. The hole argument establishes that the generally covariant Einstein field equations do not uniquely determine their spacetime solution: for any finite spatio-temporal region (the 'hole'), the Einstein field equations admit infinitely many extensions of an external gravitational field to the inside of the hole. This excess generality, Czerniawski urges, should be eliminated by invoking time flow as a non-ad hoc selection rule. Since regions containing solid objects as well as empty space qualify as regions of possible histories of matter for Czerniawski, the possibility of a global time flow, and thus of introducing global time, he continues, should provide the condition which must be satisfied by a spacetime acceptable as a physical solution. In a stark contrast to the usual eventistic ontology of GTR, Czerniawski proposes to prefer what he dubs a reistic ontology: an ontology in which physical objects retain their identity through a global time. Unabashed by the increasingly remote connections between fundamental physics and our immediate experience, he defends his proposal by insisting that we should endorse a reistic ontology rather than an eventistic one in the light of our immediate experience. Obviously unimpressed by the lessons of contemporary physics as related, for instance, in the preceding essay by Heller, Czerniawski further asserts that evolution and dynamics must be conceived of as reistic (and thus localised) concepts, viz. as systems of bodies and fields co-evolving according to their propensities to do so. Similarly, he concludes, solutions with 'causeless irregularities inside the "hole"' must be eliminated on the basis that they do not conform to the extension of the regularities outside the hole to within it. Unfortunately, Czerniawski fails to convince the author of this review in what I take to be his chief concern: introducing time flow as a non-ad hoc criterion to weed out excess solutions. The resources of GTR are insufficient to determine regularities to within the hole. But why should we endorse an extra criterion with no connection to GTR rather than just admit that GTR is an incomplete theory in the sense of the hole argument and similar considerations? The lesson to be drawn, one might argue, should be to keep looking for a more powerful theory (of quantum gravity) which will arguably resolve these issues without reverting to ill-motivated metaphysical principles.

Tomasz Placek, in his 'Branching for a Transient Time', presents a formal framework capturing transient time. Transientism advocates the objective reality of McTaggartian A-series change, maintaining that mere B-series change does not suffice to account for our experience of the

passage of time. Placek's ambition is to offer a mathematically precise and intuitively correct model for the passage of time. To this end, he presents the algebraic models of stochastic outcomes in branching space-times (SOBST), an isomorphic relative of Boolean algebras. The models of SOBST suggest what it would mean for a (classical) physical theory to accommodate becoming. SOBST models are modal models built on the notion of open future and the attrition of possibilities, i.e. the perpetual collapse of formerly undetermined possibilities into an actual and many non-existing ones. But as modal models, they are independent of physics. As Placek puts it, '[m]odality is hardly in the repertoire of extant physics, and explaining the workings of physical sciences is hardly the task for SOBST' (p. 87). He provides a very readable, and indeed, excellent, exposition of the SOBST models and relates them to a geometrical approach in the vein of relativity. There is only one concern with the paper: given its immense importance for the transientist, the key concept of attrition of possibilities deserves more attention. Placek refers to this attrition as the 'deleting of non-actualised outcomes' and explains how it is responsible for the asymmetry between past and future with respect to possibilities. But the reader is not offered insight into how such attrition is supposed to work. Is it a collapse of possible histories in the moment they are annihilated by the passage of the 'now'? Perhaps, however, it is the task of a physical theory rather than of SOBST to account for attrition. Or, as Eilstein thinks, such deleting is unanalysable. In either case, Placek would be discharged from the responsibility of explaining attrition.

In her masterful contribution 'Against Detensers (Not for Tensers)', Helena Eilstein addresses the debate between transientists and permanentists. The latter believe that the universe is nothing but the totality of existing events with definite spatiotemporal locations and with temporal relations to one another. Transientism as discussed by Eilstein entails a sharp distinction between the set of properties of individuals versus their ontological status. While the individuals' properties do not undergo qualitative change, their status successively changes from future through present to past. These successive transitions are unanalysable timeless jumps, displaying what Eilstein calls the 'atomicity of becoming'. A rather similar debate arises in philosophy of language, between detensers and tensers. The former maintain that all tensed linguistic expressions can be reduced to tenseless terms, whereas the latter insist that they are ineliminable. As the attempted reductions all fail in that they only manage to convince detensers themselves, Eilstein suggests to abandon the confinement to an analysis of language and to return to things in themselves. When attention is redirected to experience, transientism appears to command im-

pressive empirical support. However, Eilstein cautions, the atomicity of becoming stands in stark contrast with the perceived continuity of becoming. While this does not amount to a contradiction, determining the support that each camp can hope for clearly requires more work and becomes a matter of scientific inquiry. But which position is supported by science and to what extent such support goes is subject to close philosophical scrutiny. Thus, she defuses the transientist argument from indeterminism of quantum mechanics by arguing that indeterminism – in quantum mechanics or elsewhere – is also compatible with permanentism. Indeed, a closer look at physical sciences suggests that the prospects for transientism are rather dim. For instance, the (potential) extermination of time as a fundamental physical quantity in modern physics and the abolishment of absolute simultaneity spell trouble for transientists. Eilstein discusses – and dismisses – transientist attempts to reintroduce absolute simultaneity or preferred foliations of spacetimes in STR. But even if successful, the existence of an objectively privileged stratification of spacetime into instants is only a necessary, but certainly not a sufficient condition for transientism. Unfortunately, Eilstein decided to concentrate on a number of epicycles in the discussion of absolute simultaneity within STR and consequently neglects the more fruitful discussion more recent physical theories would have promised. The lesson for philosophers is that permanentism is not yet scientifically refuted (and not, as she claims, irrefutable). However, this does not imply that permanentism is true, only that it would be foolish to commit oneself to transientism.

## REFERENCES

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*The Voices of Wittgenstein. The Vienna Circle. Ludwig Wittgenstein and Friedrich Waismann.* Original German texts and English translations. Transcribed, edited and with an introduction by Gordon Baker. Translated by Gordon Baker, Michael Mackert, John Connolly and Vasilis Politis. Routledge, London, 2003, 558 pp.

The works of Wittgenstein have a long and difficult editorial history. Gordon Baker, one of the world's leading experts on Wittgenstein, shortly before his death completed an edition of texts related to Wittgenstein's works, which has now appeared as *The Voices of Wittgenstein. The Vienna Circle. Ludwig Wittgenstein and Friedrich Waismann.* The 558 page volume contains Baker's edition of more than 100 essays from the *Nachlass* of Friedrich Waismann (1896–1959), a leading figure of the Vienna Circle. The essays, previously unpublished, are printed both in the German original and in English translation. Waismann's texts are undated notes of the years 1928–1939, either dictated directly by Wittgenstein, written down by Waismann after conversations with him, or taken from Wittgenstein's typescripts. Nearly all of the edited texts date from the years 1931–1935. In those years, Wittgenstein was in close contact with some members of the Vienna Circle, especially with Waismann and Schlick. The idea came up that Waismann should write a book, based on Wittgenstein's considerations, that would explain his ideas to a wider public in a form more accessible than the *Tractatus*. While Wittgenstein would not be the author of the book, the plan was that he should be consulted in order to ensure that the book presented his ideas correctly and up to date. In 1930, the book was announced in the journal *Erkenntnis* under Waismann's name and with the title *Logik, Sprache, Philosophie*. As announced, the book was to have three parts, viz., logic, language, and philosophy. It was to be the first volume of the Vienna Circle series of books (*Schriften zur wissenschaftlichen Weltanschauung*). However, the project got into a crisis in the early 1930s, as Wittgenstein's unconventional way of philosophising and the rapid changes of his ideas in those years precluded the production of a finished book. While Wittgenstein had initially contributed to the work, he soon became more and more opposed to the project, complaining that he was "convinced that Waismann would present many things in a form *completely* different from what I take to be correct" (p. xxvi). From 1932 on, Wittgenstein wanted to be a co-author, thus gaining more control over the structure and content of the book. Waismann soon found out that joint work with Wittgenstein, who was "always following up the inspiration of the moment and demolishing what he previously has sketched" (p. xxvii), was virtually impossible. Thus, in



a third phase of the project beginning in 1934, Waismann was again to be the only author, while Wittgenstein continued to support the project by allowing Waismann and Schlick to present things based on his dictations and typescripts in a way that would suit them. After Schlick's tragic death in 1936, Waismann changed the title of the work to *Das philosophische Denken*, and the book was to be dedicated to the memory of Schlick. The text was ready in 1937, but due to the outbreak of World War II in 1939, the book never appeared.

The essays published in Baker's volume are notes by Waismann that were intended to contribute to the planned book in its various stages. Concerning content and topics, the essays are beyond any doubt recognisable as ideas of Wittgenstein's. There are copious parallels to Wittgenstein's manuscripts and typescripts from those years, as for example to the Big Typescript. There are further similarities to the transcripts of discussions in *Wittgenstein and the Vienna Circle*, which also consists of material from Waismann's *Nachlass*. It is not rare for the same formulation to appear both in Waismann's notes and in Wittgenstein's manuscripts. Still the texts also bear Waismann's mark to a greater or lesser extent. This is already obvious from the fact that the essays do not consist of remarks, as is typical for Wittgenstein's philosophising, but of continuous text divided in sections that are given headings. Waismann edited the Wittgenstein materials, which were often unordered, by sorting them thematically, supplying the Section headings and turning them into continuous text. Gordon Baker in turn arranged Waismann's texts in the order in which they are presented. In spite of all these interventions, Gordon Baker claims that due to the similarity to Wittgenstein's manuscripts, and since Waismann did not add anything to Wittgenstein's ideas, "this material has a very good claim to being treated as authoritative in the exposition and critical analysis of Wittgenstein's philosophy in the period 1928–36" (p. xxxiii). As I will show in the following, this view is correct if it is taken with a grain of salt. The texts that are presented offer an interesting perspective on Wittgenstein's philosophising in the 1930s, and they present new facets or readings of Wittgenstein's ideas in these years that are new even for experts on Wittgenstein.

Most of the themes and ideas of the essays are familiar from other works of Wittgenstein from the 1930s: In the process of an increasingly critical view on the conception of the *Tractatus*, Wittgenstein considers the questions of the independence of the *Elementarsätze*, of the possibility or necessity of a connection between language and reality, and of the role that thinking and thought play for language. Other essays consider the grammar of psychological concepts such as belief, wishing, and imagining, or they

criticise the causal model of language held by Russell. Furthermore, much space is allotted to considerations of the status of rules, of the concept of meaning, and of logical problems such as the problem of universality. All in all a broad spectrum of themes is present, and since the essays stem from an extended period of time, the view taken on a specific problem in different essays may differ. In the face of this, it is to be regretted that Waismann's notes are not dated. In terms of content, some of Waismann's essays resemble Wittgenstein's manuscripts from the 1930s very closely. However, if one compares the notes with the manuscripts in detail, two things are noticeable. First, some ideas that are only marginally present in Wittgenstein's manuscripts, such as a comparison between word language and sign language, are elaborated on repeatedly and in detail. In his critique of the conception of the *Tractatus*, as reported in Waismann's notes, Wittgenstein uses the example of sign language for a number of purposes. He uses it to argue that language is not necessarily compositional (since it seems to be unclear what the units should be from which expressions of sign language are to be composed), and that in sign language one does not step outside reality. Even though Wittgenstein's argumentation at this point need not be accepted in the light of our current knowledge about sign language, the explicit example sheds light on how his critique of the *Tractatus* developed. Second, Waismann's notes show Wittgenstein using new examples and observations that help us to shed new light on ideas of his that are already known. This is especially striking for his reflections on his new type of philosophising. He elucidates what he means by "übersichtliche Darstellung" ("perspicuous representation") as the method of his philosophy by showing what is misleading about the sentence "thinking is operating with signs" (p. 27ff.). Since in other writings there are few explicit examples of Wittgenstein's conception of "perspicuous representation", the example in Waismann's notes is very helpful for understanding this important conception. In another place, Wittgenstein examines Heidegger's phrase "Das Nichts nichtet" ("the nothing noths") and points to the fact that in some sense his method is psychoanalytical (pp. 69–77). He does not directly attack the phrase as meaningless, but takes pains to resolve the false pictures and similes that stand behind the phrase. Or again, there is a comparison between the task of philosophy and that of jurisprudence: "Fundamentally and above all, philosophy has to remove certain scruples. Its duty is to eliminate a certain kind of anxiety, and it does so by stating rules. (...) Its general importance consists in making decisions where conflicts occur, and conflicts only occur where there is a question of decisions between rules. (Here a comparison with the law suggests itself. If I give someone something as a present or lend something to a person

– in accordance with which law did I then act? In accordance to none at all. Only if conflicts occur, does the question about the law occur.) That is good for saying that philosophy has to stick to solving *problems*, by which I mean that it has to intervene where a difficulty emerges. Philosophy has not to set up a *system* of the world, as little as the law is to set up a system of action” (p. 125). Waismann’s notes are a goldmine for such examples, similes and examinations of particular cases. In contrast to Wittgenstein’s manuscripts, whose remarks by their structure constitute an open and ambiguous network, in Waismann’s notes positions are often adopted clearly and examples placed in a interpretative order. Thus Waismann in a sense disambiguated Wittgenstein’s remarks by turning them into a clearly structured text and by making connections in places where the manuscripts offer hardly any connection. Wittgenstein is seldom as clear and unambiguous as in these notes. That is an advantage and a disadvantage – an advantage, since the context of the notes suggests readings of remarks that are sometimes new and often interesting and exciting, but a disadvantage, since it remains unclear whether Wittgenstein intended the connections suggested by the continuous text. Be that as it may, Waismann’s essays certainly add new and important facets to our picture of Wittgenstein.

Together with his collaborators, Gordon Baker has done an immensely valuable service to all students and scholars interested in Wittgenstein. Baker’s 48 page introduction gives a detailed account of the background of the texts presented, describes Waismann’s life and informs about the amount of contact between Wittgenstein, Waismann and Schlick in the early 1930s. The book is thus both a valuable supplement to Wittgenstein’s manuscripts and typescripts from the 1930s and a document of the co-operation of Wittgenstein and Waismann, showing us how Waismann made Wittgenstein’s ideas fruitful and how Wittgenstein collaborated with the Vienna Circle. Baker’s book belongs to the side of the edition *Wittgenstein and the Vienna Circle*. Like that volume, it is one that no collection of sources on Wittgenstein can afford to miss. Its plenitude of examples, exciting connections of themes and lucidity of argumentation will certainly inspire the reader. As the title says, more than one voice can be heard in it.

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Louise M. Antony and Norbert Hornstein (eds.), *Chomsky and his Critics*, Blackwell, Oxford, 2003, x + 342 pp., Hardback, ISBN 0631200 207, \$68.95, £55.00, Paperback, ISBN 0631200 215, \$31.95, £16.99.

The present volume is the tenth installment of Blackwells' series wherein prominent philosophers reply to a collection of previously unpublished papers. Chomsky, of course, even in academic circles, is less known as a philosopher, more known as a political critic, and the founder of modern linguistics. It is to be hoped that this collection contributes to the wider appreciation of the serious challenge Chomsky's ideas pose for many a philosophical doctrine. That such a hope will be realised is moot. I do not mean to slight the editors – they are to be congratulated – still less the contributions, most of which are serious attempts to counter or illuminate the philosophical aspects of Chomsky's voluminous output, and all elicit interesting replies from him. The fact is that the collection lacks the clout to interrupt the dogmatic slumber of most philosophers. Consider the (partial) list of philosophers to whom Chomsky has had something substantial to say, many of whom have previously responded to him: Quine, Goodman, Putnam, Dummett, Davidson, P. Strawson, Kripke, Fodor, Katz, Burge, Searle, Nagel, Harman, the Churchlands, Stich, Soames, ... One might also mention any number of others whose views run counter to those of Chomsky (e.g., Dennett and his Darwinian optimism (especially see his egregious discussion of Chomsky in *Darwin's Dangerous Idea*), Brandom and his antiquated substitutional account of linguistic structure, McDowell and his pre-modern "enchantment", etc.). Leaving aside those who are sadly no longer with us, none of the above contribute to the collection. One is left with the impression that Antony and Hornstein didn't have an easy time attracting some obvious 'big name' candidates to the project. After years of having their positions calmly demolished, some have perhaps been left with the thought that they are dealing with an obtuse mind.

The first three of the ten papers deal with broad metaphysical issues arising in Chomsky's recent discussions of physicalism/materialism and naturalism.

Since the late 1960s, Chomsky has been suggesting that there is an anachronistic incoherence in the way notions of the physical/material have been deployed in philosophy. Chomsky's target is the standard methodology whereby the philosopher a priori decides upon the resources available to a scientist/naturalist, then insists that some particular philosophically contentious issue – consciousness, intentionality, etc. – is amenable to naturalistic treatment (for good or ill) just to the extent that it is explainable in terms of the resources antecedently determined. For Chomsky, such



a position has nothing to do with modern science. In stark terms, post-Newton, it is not so much 'mind' we don't understand, but 'body': the Newtonian revolution exorcised the body from the machine, the ghost remains to be explained. In this light, we ought to approach the 'mind' as just another aspect of the world, similar to the chemical or the biological. There is no issue of legitimacy here beyond the assessment of particular explanatory theories of the mental, be they about language, consciousness, perception, etc. There is no mind-body problem. A genuine naturalism is *methodological*, not metaphysical.

In a typically entertaining article, William Lycan ('Chomsky on the Mind-Body Problem') defends a functionalist position on mental states. On this view, the mind-body problem is genuine and putatively solved: the mind is a certain functional organisation of body. We need not tarry over just what 'body' amounts to; we may leave physics free to substantiate whatever implements the independently identifiable mental states.

Lycan is perhaps speaking for many. Indeed, one draw of functionalism is precisely that it does eschew a flat-footed physicalism. Chomsky, though, suspects that even functionalism harbours a priori assumptions about 'body' which are unwarranted. A more specific response, however, targets the traditional virtue of functionalism. A now standard thought, originating with Putnam, is that a virtue of functionalism is its rejection of the 'species chauvinism' of the 'identity theory'; under functionalism, aliens, dogs and machines all (potentially) get to be in the same type of mental state, notwithstanding distinct physical substrates, due to a shared functional profile. Such a typing might well better cohere with our pre-theoretical notions about the distribution of mentality, but from the optic of methodological naturalism, nothing is gained beyond the likely explanatory pay-off, which, in the present case, is not noticeably great. To see Chomsky's point here, consider his view of linguistics as an inquiry into a uniquely human, biological phenomenon. Such inquiry is not animated by an attempt to discern an equivalence class of all those organisms to which we might wish to ascribe 'language'; rather, we seek to understand the underlying computational structure of an aspect of human biology, not some nebulous functional notion of communication or arbitrary symbolic systematicity. It might turn out that some cross species equivalence class supports interesting generalisations, but we don't begin with that assumption. Independent of such surprising findings, questions of whether birds, bees, and dolphins have language too, is an idle semantic question. Here, inquiry would be crippled by avoiding 'species chauvinism'. The point is methodological: once free of the mind-body problem, we should not be

side-tracked into thinking that there is any urgency or obvious pay-off in characterising mental states in general.

Jeffrey Poland ('Chomsky's Challenge to Physicalism') offers a sympathetic response to Chomsky's admonishments on materialism. Poland argues for a *methodological physicalism* which, rather than affecting to offer a substantive meta-theory for philosophy or science, consists of *regulative ideals* of finding underlying structure and seeking potential unification (including the alteration of lower level theories to incorporate the established results of higher level sciences – a point much emphasised by Chomsky) which may guide theoretical construction and assessment. Poland's ideas are very interesting and demonstrate the positive value Chomsky's work has for philosophical reflection on science.

Unlike Poland, Galen Strawson ('Real Materialism') presents a non-methodological account of materialism – *realistic materialist monism*. For our purposes, the paper may, in essence, be read as suggesting that Chomsky's metaphysical views have a precedent in the empiricist tradition running from Hume to Russell's neglected position of the 1920s, under which we know the structural effects of objects without understanding the nature of them such that they have such effects. Such a reading of Hume, if not Russell, is familiar from Strawson's *The Secret Connexion*. About Hume, Strawson is, at the very least, interestingly wrong. The soundness or, indeed, innocence of attributing such a metaphysics to Chomsky is more doubtful. Chomsky remains wholly methodological in his outlook. These are, though, interesting issues which are not often explored. Hume's claim, for example, that our understanding of causation is more instinctual than rational, is properly seen by Chomsky not to be a species of behaviorism; rather, it is more fruitfully construed as a claim about the limits of reason which remains wholly neutral as to the existence and character of the 'causes'. Otherwise put, the limits of our understanding of things arise from the shape, as it were, of our native cognitive capacity, not from the nature of things in themselves ranged against a formless mind. We can, for sure, provide a metaphysical gloss to this cognitive thesis, but little is thereby gained, save for an increase in the likelihood of misunderstanding.

The next three papers take up issues to do with Chomsky's rejection of the cluster of assumptions that have animated recent philosophy of language/mind: principally, intentionality, externalism, and referential semantics.

Francis Egan ('Naturalistic Inquiry: Where does Mental Representation Fit in?') agrees with Chomsky that we should seek computational theories of our various cognitive capacities, e.g., vision and language, where such theories are wholly concerned with internal states. Egan departs from

Chomsky in attempting to find a principled role for intentionality – mind-world relations – in our understanding of these states. Egan's position echoes that of numerous others who contend that only by viewing a computational system as environmentally embedded can we glean what it is *for*; otherwise, we are left with a 'syntactic engine', which is, say, no more a visual system than it is a linguistic system.

It is curious that Egan does not note, and Chomsky's reply does not remind her, that such a consequence is precisely welcomed by Chomsky. The real issue is what other systems a given computational system is interfaced with, such that the cognitive system as a whole exhibits the capacities we find. Such inquiry is not beholden to ignore external relations; but the question needs to be posed: When and how are they relevant? In particular, inquiry into computational systems does not ignore representational content. For Chomsky, the matter is academic, for no clear notion of representational content is at hand to play any kind of constraining role in the development of a computational theory. Chomsky's position on this issue has been the cause of much confusion; in his reply to Egan, Chomsky is clear: inquiry into cognition ought not to be constrained by the commonsensical notions of thought and representation with their quasi-causal status. In this respect, cognitive science is just like any other science: our common forms of discrimination are left behind.

George Rey ('Chomsky, Intentionality, and CRTT') addresses similar issues to Egan in the form of an attempt to make sense of Chomsky's appeal to representation, knowledge and computation. Rey's paper and Chomsky's reply are perhaps the most valuable parts of the collection, if only because the former creates an opportunity for the latter to clear away common confusions.

Rey, like many before him, reads Chomsky through the set of commitments familiar from the work of Fodor, which Rey encapsulates as the Computational Representational Theory of Thought: roughly, the thesis that mental states get to be both causally active and subsumable under intentional generalisations through being computational states, i.e., states that are both physically realised (and so causally efficacious) and structured so that the transitions between them respect intentional properties (preserve truth). From what has already been said, it should come as no surprise that Rey finds Chomsky to be at best obscure in his apparent commitment to CRTT, for Chomsky holds to no such thesis. Chomsky is careful in his reply to detail many, if not all, of Rey's misunderstandings. To pick up one central strand: the majority of Rey's queries dissipate like smoke in the wind when it is noted that Chomsky has never understood 'representation' to be an intentional notion. For Chomsky, 'representation'

is a structural notion derived from concatenation algebra, i.e., it marks a condition of being ‘well-formed’ over a primitive ‘alphabet’ closed under a finite set of operations. In other words, ‘representation’ is a wholly syntactic notion that is not constrained to meet any conditions that issue from our ‘folk’ conception of mental states and their transitions. That said, Rey might well have a point: perhaps it would be better if Chomsky were to drop ‘representation’ (as Jackendoff – *Foundations of Language* – has recently done). It would, at least, be of some benefit to mutual understanding if commentators were not so ready to ignore Chomsky’s admonishments about how he should be read.

Like Egan, Peter Ludlow (‘Referential Semantics for I-Languages?’) seeks to show that an adequate account of internal states – in particular, the states of the language faculty: I-languages – ought to find a place for referential relations to semantic values. Ludlow’s arguments are characteristically interesting and informed, and contain a valuable discussion of awkward cases such as ‘The average family has 2.5 children’. The upshot, however, is a species of Kantian empirical realism, where the purported external relata are partly individuated by the internal conceptual resources of the lexicon/language faculty. This doesn’t strike me as the kind of externalism most philosophers argue about, nor the kind Chomsky rejects. The worth of such Kantian externalism devolves upon what explanatory role such de-transcendentalized relations might play. It is difficult to say. The posited external objects (semantic values) appear to be merely the ontological reflex of construing ‘representation’ as a relational notion, as opposed to a structural one.

The remaining four papers allow us to see Chomsky’s work from the perspective of some familiar philosophical positions. Paul Horwich (‘Meaning and its Place in the Language Faculty’) has long argued against a referential account of meaning in favour of a use/conceptual role approach. At least negatively, Horwich and Chomsky are in agreement. Horwich seeks to buttress this agreement by elaborating a “very simple picture” of the language faculty in which there are no substantial semantic features of lexical items; instead, ‘meaning’ is determined by the ‘regularities of use’ exhibited by combined ‘I-sounds’ produced in accord with syntactic schemata. It is unclear in what sense the model is simple. The model makes essential appeal to combinatorial procedures (as well as schemata) that encode the categoricity of the lexical items to be combined. This kind of duplication of information is highly unattractive and enjoys no empirical support against a model which enriches the lexical items at the expense of seemingly redundant particular rules. Chomsky’s reply offers other arguments on the same theme.

According to Chomsky, there is no particular empirical or conceptual demand to have a ‘theory of meaning’ – construed as a theory of propositional content – beyond whatever accounts for distribution phenomena and ‘felt relations’ (e.g., inference, analyticities, etc.). On Chomsky’s view, this burden is in the brief of lexical semantics and syntax generally.

A good example of Chomsky’s approach to these issues is offered by Paul Pietroski’s excellent paper (‘Small Verbs, Complex Events: Analyticity without Synonymy’), which takes up the venerable matter of causatives and analytical relations, an issue again *en vogue* in the semantics literature. Pietroski shows how we can have an adequate ‘eventish’ semantics for causatives (e.g., ‘Bill boiled the water’) without falling foul of the familiar arguments against treating the causative aspect as enshrined in a derivational/synonymy relation (e.g., ‘Bill boiled the water’ need not be derived from ‘Bill caused the water to boil’). The account involves an eventish reading under existential closure of the kind of little-*v* syntax developed in the early 1990s, which has since been integrated into the minimalist program. Many interesting issues arise here concerning our understanding of analyticity, synonymy, and the interpretation of eventish semantics. These are intriguing matters for future research.

Ruth Garrett Millikan (‘In Defense of Public Language’), *pace* Chomsky, argues that a notion of a public language is fit to serve as what the competent speaker understands or knows. Such a language is a shared set of conventions for communication. On this view, linguistic structure arises from particular forms being adaptive to certain communicative ends – information coordination. This model is a familiar one seen through the lens of Millikan’s biological naturalism. Chomsky’s reply is as one would expect. Unless it is shown how this notion of functionality may begin to explain the structure and acquisition of *any* of the syntactic forms and relations with which linguists generally concern themselves, the approach amounts to not much more than a wish to have language fall under antecedent assumptions about mentality in general. For Chomsky, the case of language seriously challenges the kind of functional assumptions Millikan (and many others) take to be pre-established. Further, it is worth pointing out that Chomsky’s complaint has never been that public languages don’t *exist*. One is free to define ‘English’, say, as a set with some complex membership condition *C*. Some such set may or may not accurately answer to our intuitions about what English is. Whatever our intuitions, when we turn to cognitive questions – What does a speaker/hearer know? How is the knowledge acquired? How is the knowledge put to use? – any publicity requirement fundamentally hinders rather than helps inquiry. Our purpose is to explain linguistic phenomena, not to analyse the concept ENGLISH.

The final paper ('Theory Theory as an Alternative to the Innateness Hypothesis') sees Alison Gopnik argue against Chomsky's wholesale nativism in favour of a more empiricist model (the 'theory theory'), whereby the developing child is as if a little scientist, constructing theories and seeking to verify them by the available data. The child's innate endowment just covers those general resources required for theory construction (whatever they might be). The problem with such a contrast couched in general terms, as Chomsky points out in his reply, is that, in at least one sense, nativism is simply trivially true – there is no fancy hypothesis. Normal human infants grow arms, not wings. This is a difference in nature no-one but the befuddled would wish to demur. An interesting contrast only arises when we look in detail at particular cases and ask what the organism must bring to the acquisition situation given estimates of the 'data' available and the complexity of the species typical endstate of the acquisition process. In the case of language and vision, say, theory theory looks like a non-starter, and Gopnik says nothing to have us think otherwise.

A fault running through much contemporary work on this issue is the presupposition that innateness is solely a cognitive issue. Chomsky makes clear in his reply (for the umpteenth time) that the cognitive is continuous with the biological. The cognitive cases, therefore, are mere instances of biological development: the same fundamental problems arise with puberty as they do with language. From this perspective, the theory theory approach appears to be an exceedingly partial account of high level cognitive capacities, at best.

There is much in this collection that should be of interest to any philosopher seriously concerned with language, mind and the philosophy of science. As always, one may quibble. One might have hoped for a paper or two on the relation between Chomsky's political/social views and his general philosophical/scientific outlook – Chomsky only comments on this intriguing issue when prompted. Some discussion of Chomsky's views on the issue of modularity would also have been welcome. This is the area, politics aside, where Chomsky is perhaps most often misunderstood.

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