

## BOOK REVIEWS

Massimiliano Carrara, Alexandra Arapinis, and Friederike Moltmann (eds.), *Unity & Plurality: Logic, Philosophy, and Linguistics*, Oxford: Oxford University Press, 2016, xv + 259 pp., £45 (hardback), ISBN 9780198716327.

*Unity & Plurality* is a collection of ten original contributions in the debate about plurals, at the intersection between logic, philosophy, and linguistics. Plural constructions occur ordinarily in natural languages; until recently, however, this was hardly reflected in their purported semantic or logical regimentation. A “singularist approach” dictated that there are only singular referring terms (referring to *one* thing), singular variables (having *one* thing as value) and relative quantifiers, and singular predicates (being true of *one* thing per argument place). Plural terms such as “the students”, for example, were taken to singularly refer to a sum-like or set-like entity composed of students. A contrary “pluralist approach” has recently been gaining attention, especially in logic and philosophy. The book shows that there are several reasons for this shift.

First, plurals are remarkably resilient constructs. Singularist translations, if available at all, often sound like unnatural paraphrases of sentences containing plurals. Secondly, plural logics are the simplest way to frame comprehension principles about the collection of individuals into sets, or their fusion into sums. Finally, focusing on the logical and philosophical side of the debate, plural logic(s) can step in for higher-order logic or set-theory whenever they are considered too ontologically committing and not “logical” enough, or when they lead to contradictions.

Boolos, with his plural interpretation of second-order logic, was perhaps the first to explicitly discuss these themes. The driving idea is to take second-order quantification not as singular quantification over an extended, and possibly problematic, domain, but as a different kind of quantification over the same domain.<sup>1</sup> *Unity & Plurality* offers an opportunity to reflect on the virtues and applications of pluralist approaches, but also on their relation with other linguistic phenomena. That the volume gathers contributions from a somewhat vast horizon

<sup>1</sup> Boolos (1975, 1984, 1985); the reader will find all three in Boolos (1998). As this volume shows, however, the relation between plural and second-order logic is far from fully understood.

of perspectives only highlights the attention devoted to plurals in logic, philosophy, and linguistics. The volume accordingly divides into two parts: “Pluralities in Logic” and “Pluralities in Semantics”.

In the first chapter, Theodore Scaltsas demonstrates that pluralist approaches are not new in philosophy. After having shown that Plato allowed for irreducibly plural predication, the author argues that we can use it to account for related objects without relational Forms. The basic idea is that objects are related by plurally partaking of a single Form (at least for symmetric relations); this urges us to rethink relations, not as “bridges”, but as joint qualifications. The proposal is intriguing, albeit somewhat problematic; the author focuses on equality relations, and speaks of, say, equally beautiful things as “beautiful together” (p. 12), which makes it evident that plural predication is involved, but deceivingly so – for not all symmetric relations can be squeezed into that form. Then there are asymmetric relations. Forms are *monoeidic*, viz., they offer only one qualification to the objects. But given that, in the case of asymmetrical relations, the *relata* are differently qualified, we cannot think of them as plurally partaking of any single Form. The author suggests, rather, that they partake of Opposite Forms, quantitative differences on a qualitative continuum – one each. One may ask whether all asymmetric relations can be treated in this fashion; e.g., are *being a mother* and *being a daughter* quantitative differences on a continuum? More importantly: how is this plural predication at all? According to the author, the partaking of Opposite Forms is plural insofar as the correspondent qualifications are “interdependent” and “relative to each other”. Such notions cannot, at the pain of circularity, be cashed out through non-monoeidic meta-Forms, nor in terms of *sui generis* relational Forms; perhaps they are primitives of the theory, although the author doesn’t explicitly say as much.

In the second chapter, Øystein Linnebo casts the Russell–Cantor paradox, and higher-order comprehension principles, under a new light. When plural logic is used to formulate the contradiction, a natural strategy would be to keep unrestricted comprehension for pluralities, but not for sets – the idea being that some of them would be “too big”. For Linnebo, however, any restriction in the cardinality of sets is bound to be arbitrary; contrariwise, there is genuine philosophical pull towards “collapse principles” in which many things are collapsed into one – in the sense that the many introduced through plural or higher-order logic (which for him, are distinct things) can fully characterize first-order entities such as sets and properties. The problem is rather that there is an ambiguity in the interpretation of quantifiers in both comprehension principles; a standard reading and a modalized one – of a peculiar kind of modality, similar to Fine’s “interpretational modality”. Roughly put, this modality corresponds to the possibility of introducing new elements in the ontology by way of individuating them. According to the non-modalized reading, it is true that unrestricted comprehension holds for

pluralities but not sets – for, although the elements exist, the set might not already be individuated. The contrary holds in the modalized reading: because pluralities are extensional entities, modalized unrestricted plural comprehension fails.

Alex Oliver and Timothy Smiley argue against an alternative singularist strategy, the “predicative analysis” (PA) that takes plurals such as “the students” as predicates – and any plural construct such as “the students study” as second-order predication. The article is somewhat wide in scope, since PA features prominent advocates, from Russell and Whitehead to Dummett. Yet, the position is gravely problematic, and not only because it drives a deep wedge between surface grammar and logical form of plural constructs: the authors propose an objection that is supposed to sink it entirely. After having diagnosed Dummett’s mistakes in his outline of PA in *Frege: Philosophy of Mathematics*, they propose a characterization of PA based on a type-raising function  $\uparrow$ , turning the first-order predication  $F(a)$  (where  $a$  is a plural) in second-order predication  $F\uparrow(a\uparrow)$  on a first-order predicate  $a\uparrow$ . An “equivocality objection” is then raised, according to which PA does not preserve a crucial feature of natural languages, namely that the same predicate can have both singular and plural subjects. The same objection is raised against Boolos’ plural interpretation of high-order logic, conversely understood as a formal representation of plural phrases through second-order logic. This leads to the conclusion that second-order logic is an improper tool for the formalization of plurals.

Peter Simons proposes a formal theory of (high-order) multitudes, which, unlike set-theory or mereology, is truly logic: for a multitude, as a “mere plurality”, is just some objects. Thus, even if multitudes, like sets, are extensional, there are no empty multitudes. Because “we do not extract something from nothing” (p. 64) there are non-multitude ur-elements, introduced as multitudes (things) with only themselves as members; things with more than one member are pluralities. Higher-order multitudes are allowed by taking membership as non-transitive; like sets, multitudes are not “hyperextensional” in Goodman’s sense; viz. there can be distinct multitudes with the same ultimate content. A second-order logic, with identity and a membership predicate, is introduced to axiomatize these ideas, and the resulting system is interestingly different from both standard set-theory and extensional mereology. Following Boolos (1985), Simons individuates an application of his logic of multitudes in a nominalistically acceptable model semantics for first-order logic, and discusses how to reconstruct n-tuples without abstract objects. Finally, Simons insists that the formal system deserves to be called logic insofar as it does not postulate, nor entail, the existence of anything.

The theme of logicality leads to the next contribution. Francesca Boccuni, Massimiliano Carrara, and Enrico Martino defend the logicity of Boolos’ plural interpretation of second-order logic. Although Quine-inspired criticisms seem to ignore the crucial point that plural logic does not need to engage in any reification

of pluralities, there remains the point that Boolos took plural quantification as primitive, thus making it hard to evaluate its logicity. This is soon to be rectified. The key of the new semantics is the notion of arbitrary reference (which is used in an all-encompassing way to include the arbitrary assignment of values to bound variables). Arbitrariness has to be cashed out epistemically, in terms of freedom of choice by an ideal agent. *Plural* arbitrary reference requires the introduction of an “infinite team of agents” (p. 82), each of them performing an independent act of choice of individuals from the domain, in order to settle plural reference and quantification. A semantics of acts of choice (SAC) is developed accordingly. Despite the substantial postulation of infinite ideal agents, it is finally argued that SAC satisfies Linnebo’s three conditions of logicity: ontological innocence, universal applicability, and cognitive primacy. Interestingly, it is argued that quantification in the semantic meta-language (in this case SAC) counts in the evaluation of a theory’s ontological commitments (in this case second-order logic). This may remind the reader of the nominalist’s pickle, earlier discussed by Simons, of having a semantic meta-language for first-order logic explicitly dealing in sets.

A recurring theme in the first half of the volume is that pluralities, when properly understood, are *more* ontologically innocent than sets and sums. For the reader with philosophical sensibilities, this might be an interesting claim to consider. The literature now abounds with definitions of “ontological innocence”, and “no addition to being”; usually, however, claims of “ontological innocence” are metaphysical theses achieved by means of thoroughly metaphysical relations. For example, recently many have conceived of an asymmetric relation holding between Socrates and {Socrates}, allowing the former to be no addition to being over the latter. Yet, this seems to be a somewhat substantial reification of sets, as numerically distinct from their members; for if the relation is asymmetric, then  $\text{Socrates} \neq \{\text{Socrates}\}$ , which only makes sense under the assumption that collecting object(s) into sets takes some metaphysical toll. Furthermore, this opens the possibility of rejecting this metaphysical thesis, allowing sets to fail to exist even if their members do – a position Simons explicitly “dare[s] to adopt” (p. 60). This is not a wildly implausible claim either; Linnebo (p. 28) effectively develops a way to take seriously the idea that one *can* have  $x_1, \dots, x_n$  without thereby having  $\{x_1, \dots, x_n\}$ . Yet, as Simons immediately notices, the case of pluralities is entirely different. There is no serious metaphysical position to associate with the claim that a plurality does not exist even if its members do, for the innocence of pluralities is not achieved by any relation in which pluralities enter. In claiming that “a plurality is some objects”, one is not endorsing a one-many identity claim, such as that put forward by some supporters of the innocence of mereology. Talk of pluralities is rather a convenient notational variant of long-winded English paraphrases of plural logic sentences. The strength of the pluralist approach is that there is nothing in the domain of plural logic to label

as an “innocent” plurality. Ontologically innocent, rather, are the plural phrases in natural languages, or perhaps second-order quantification in formal ones. Fittingly, in the first pages of the second part of the volume (p. 93), Friederike Moltmann distinguishes the singularist and the pluralist by claiming that “the first [...] makes plurality a matter of ontology, the second makes it a matter of reference.” Something similar could be said about the innocence of pluralities – as Lewis (1991, 87) was perhaps the first to notice. Thus, pluralist approaches suggest an interesting philosophical development, namely a distinction between two peculiarly different senses of “ontological innocence”: a weaker (more problematic) sense, obtained *via* metaphysics, and a stronger, and clearer one, obtained *via* semantics. (This, incidentally, might be why imposing any restriction on plural comprehension principles appears less viable an option than restricting comprehension principles for sets.)

Moltmann opens the second part of the volume. She qualifies the difference between singularist and pluralist approaches as an inherently semantic difference: *Reference to a Plurality* (RP) vs. *Plural Reference* (PR). She discusses the issues of the mereological version of RP. If each student is a part of the referent of “the students”, then, according to extensional mereology, each student-part is so too; furthermore, no higher-order plurality is possible – two problems Simons previously solved by denying the transitivity of membership to a plurality. No such problem plagues Moltmann’s favorite version of RP, the “information-based account”, in which “integrity conditions” dictate which entities count as *integrated wholes*, and, amongst other things, may allow for variations in the formal properties of the parthood relation. According to the author, such integrity conditions are a highly contextual matter; thus, whether nominal phrases refer to integrated wholes also depends on the circumstances. The problem of all versions of RP is ultimately that they treat pluralities as individuals, namely things that can be counted as one. Observing the behaviour of number-related predicates undermines this idea. Ultimately, there is a strong pull from natural language to endorse RP – although there are natural language phenomena involving the reification of pluralities into one individual. (One may wonder what consequences this bears in the overall ontology of plurality; does linguistic semantics suggest the existence of two kinds of plurality – one more innocent, one less?)

Yi, on the other hand, discusses the treatment of plural constructions within the theory of generalized quantifiers (*GQT*). An extension is proposed, called *pluralist GQT*, incorporating the analysis of plural determiners; for, as it stands, *GQT* is unfairly biased against pluralist approaches, and takes plural determiners (e.g. *some, all, many...*) as mere variants of their singular counterparts (e.g. *a, the, every...*). In (pluralist) *GQT*, quantifiers proper are the result of combining determiners with noun phrases (e.g., “the student”, “some girls”, etc.) – monadic second-order predicates of a special kind. A radically different approach, generalizing Russell’s

account of definite descriptions, takes determiners to be quantifiers themselves, (binary) second-order predicates; Russellian GQT is thus presented, with a pluralist variant on its own. The author is not interested in deciding between standard and Russellian GQT – but only in arguing that both are inferior to their pluralist counterpart. Finally, Yi deals with some challenges to contemporary accounts of determiners and quantifiers. These constructions do not involve pluralist determiners directly, but phenomena such as crossing co-reference and so-called “donkey” anaphora.

In the next contribution, Thomas J. McKay discusses the analysis of mass predication/quantification. The author notices that Quine was somewhat interested in giving mass predication/quantification a special status – although the standard position is to assimilate mass predication to singularist predication, assuming that any predication involving mass terms (e.g. “gold”) is predication of some thing that is gold. However, mass – or stuff – talk cannot be assimilated to talk of parts, or portions. Formal principles for the use of mass terms are thoroughly discussed. Finally, the relation between mass and plural predication is discussed; it is argued that, although there are similarities between the two, mass terms are ultimately a beast of their own.

The topic of mass terms brings us to the next chapter. Paolo Acquaviva has perhaps the most radical conception of pluralities in the volume. According to him, plurality is merely a classifier – or a divider – in natural language, ultimately a matter of grammar more than ontology. Plurality is “a grammatically encapsulated component of meaning [which] expresses the division of reference into a domain organized into parts” (p. 211). The plural aspect of a noun, which is, after all, a grammatical feature, can characterize the noun’s denotation as extended, and divisible into parts. Plural terms in subject positions impose a complex part-structure on their denotations, whereas plural denotation proper is considered a special case. The chapter also displays an emphasis on an empirically confirmed, yet usually neglected phenomenon: non-canonical pluralizations, viz. the pluralization of nouns that are not count nouns. The clearest case is that of mass plurals such as *waters*. (Incidentally, the presence of mass plurals in natural languages fits well with the conclusion of the previous chapter; if mass predication/quantification cannot be assimilated to plural predication/quantification, this opens the possibility of mass terms having plural variants.)

Finally, Alexandra Arapinis investigates the phenomenon of partial involvement – in which a predicate is truthfully said of a plurality, but is only satisfied by some members of it. The contribution also explores the ontology of groups, the kind of pluralities involved in such phenomena. The most common strategy is to understand partial involvement as a pragmatic weakening of universal quantification in distributive readings. The author shows that partial involvement is not a distinct, pragmatically defined kind of distributivity, but that it must be

incorporated into semantics. Furthermore, it is argued that groups are “more than the mere addition of their members” (p. 251), although it is difficult to properly evaluate the ontological novelty they bring about. As a semantic phenomenon, partial involvement occurs more frequently in the case of plural nouns that are “more intensional”, viz., that allow for more failures of substitutivity. It may be worth noticing that Arapinis does not take into consideration pluralist approaches, considering pluralities to be sum-like or set-like entities. Pluralist approaches are occasionally neglected or rejected in contributions from linguistic semantics, as extensively discussed by Moltmann in the introduction and her chapter.

All in all, there is much to be learned from *Unity & Plurality*. The specialist in any of the fields represented will find thought-provoking developments but will also catch a glimpse of other disciplines involved in the study of plurals. The book stimulates fascinating comparisons, too. For instance, that pluralist approaches have found their way more easily into philosophy and philosophical logic – rather than natural language semantics – may be in itself food for thought.

#### REFERENCES

- BOOLOS, G. 1975, “On Second-Order Logic”, *Journal of Philosophy*, **72**, 16, pp. 509–527.  
 BOOLOS, G. 1984, “To Be Is to Be a Value of a Variable (or to Be Some Values of Some Variables)”, *Journal of Philosophy*, **81**, 8, pp. 430–449.  
 BOOLOS, G. 1985, “Nominalist Platonism”, *Philosophical Review*, **94**, 3, pp. 327–344.  
 BOOLOS, G. 1998, *Logic, Logic, and Logic*, Cambridge, MA: Harvard University Press.  
 LEWIS, D. K. 1991, *Parts of Classes*, Oxford: Blackwell.

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Marcus Arvan, *Rightness as Fairness: A Moral and Political Theory*, Basingstoke, UK: Palgrave Macmillan, 2016, xi + 271 pp., £88.39 (hardback), ISBN 978-1-137-54180-2, eBook ISBN 978-1-137-54181-9.

In *Rightness as Fairness*, Marcus Arvan sets himself an extremely ambitious goal: finding a new foundation for morality, one that would outperform the usual contenders in moral philosophy. The entire project is built on the following methodological stance: just as our best scientific theories do, our moral theories should respect seven principles that allow us to distinguish genuine truth from merely seeming truth. As far as possible, they should: be grounded in claims that are