Bibliography on Abstract Entities

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August, 2001

Universals

Some anthologies:

Landesman, Charles, ed. 1971. *The Problem of Universals*. (New York: Basic Books).

Loux, Michael J (Ed). Universals and Particulars: Readings in Ontology. University of Notre Dame, 1976.

Mellor, D H (ed); Oliver, Alex (ed). "Properties", Oxford Univ Pr : New York, 1997

> This volume offers a selection of the most interesting and important readings on properties beginning with the work of Frege, Russell and Ramsey. In particular, it makes accessible for the first time contributions to the contemporary controversy about the nature and roles of properties: Do they differ from particulars? Are they universals, sets or tropes? How are properties involved with causation, laws and semantics? The editors' introduction guides the novice through these issues and critically discusses the readings.

Van Inwagen, Peter, and Dean Zimmerman, eds. 1998. *Metaphysics: The Big Questions*. (Malden, MA: Blackwell).

Van Iten, Richard J., ed. 1970. *The Problem of Universals*. (New York: Appleton Century Crofts).

> This has lots of good historical selections on the problem of universals, as well as selections through the middle part of the 20th century.

Articles and Books:

Agassi, Joseph; Sagal, Paul T. "The Problem of Universals", Philosophical Studies. 1975; 28,289-294

> The pair Democreteanism-platonism (nothing/something is outside space-time) differs from the pair nominalism-realism (universals are/are not nameable entities). Nominalism need not be Democretean, and Democreateanism is nominalist only if conceptualism is rejected. Putnam's critique of nominalism is thus invalid. Quine's theory is Democretean-when-possible: Quine is also a minimalist Platonist. Conceptualists and realists agree that universals exist but not as physical objects. Nominalists accept universals only as "facons de parler".

Armstrong, D. M. 1989. *Universals: An Opinionated Introduction*. (Boulder, CO: Westview Press).

Armstrong, D. M. "Properties in Language, Truth and Ontology, Mulligan, Kevin (ed)", Kluwer : Dordrecht, 1992

It is argued that we must admit objective properties (and relations) into our ontology, although there are many predicates which do not pick out such properties. Should these properties and relations be taken to be universals or particulars? That issue is delicate, although the author would plump for universals.

Armstrong, D M. 1991. "Arda Denkel's Resemblance Nominalism", Philosophical Quarterly. 1991; 478-482

Arda Denkel, in "Real Resemblances," argues for a moderate Nominalism where substances objectively have properties and relations, the latter being particulars, but dependent particulars, grouped into classes by objective relations of resemblance. This view is contrasted unfavorably with the view that properties and relations are universals instantiated by particulars. It is conceded that Denkel's scheme has much to commend it. But it is argued that the universals view has much more to be said for it than Denkel allows, and that it is indeed, on balance, the superior view.

Armstrong, D M. "In Defence of Structural Universals.", Australasian Journal of Philosophy. 1986; 64,85-88

this note replies to david lewis's article "against structural universals" (same issue). He argues against such universals by invoking the mereological principle that two different things cannot be composed of exactly the same parts. The author replies that lewis's principle would tell against universals generally. Suppose that "a" r "b" and "b" r "a" with r a non-symmetrical dyadic universal. Lewis's principle is still violated. Any upholder of universals, structural of otherwise, should therefore reject the principle. For to assert the principle is to beg the question against universals. The author concludes that, as between lewis's principle and the acceptance of universals, the situation is a stand-off.

Armstrong, D M. "Against "Ostrich Nominalism": a Reply to Michael Devitt.", Pacific Philosophical Quarterly. 1980; 61,440-449

In my reply to michael devitt, it is argued, first, that quine fails to appreciate the force of plato's "one over many" argument for universals. It is argued, second, that quine's failure springs in part at least from his doctrine of ontological commitment: from the view that predicates need not be treated with ontological seriousness. Finally, an attempt is made to blunt the force of devitt's contention that realists cannot give a coherent explanation of the way that universals stand to particulars.

Armstrong, D M. "Naturalism, Materialism and First Philosophy.", Philosophia . 1978; 8,261-276

First, the doctrine of naturalism, that reality is spatio-temporal, is defended. Second, the doctrine of materialism or physicalism, that this spatio-temporal reality involves nothing but the entities of physics working according to the principles of physics, is defended. Third, it is argued that these doctrines do not constitute a "first philosophy." a satisfactory first philosophy should recognize universals, in the form of instantiated properties and relations. Laws of nature are constituted by relations between universals. What universals there are, and what relations hold between them, must be discovered "a posteriori" by scientific investigation.

Armstrong, D M. "Universals and Scientific Realism: a Theory of Universals", Vol 2.", Cambridge univ pr : Cambridge, 1978

It is argued that what particular universals (properties and relations) there are should be established "a posteriori", on the basis of total science, and not on "a priori" considerations. Uninstantiated universals are rejected, and it is argued that there are no simple correlations between predicates and universals. Disjunctive and negative universals are rejected, but conjunctive universals accepted. An analysis of resemblance is given in terms of universals. An account of nomic connection is given in terms of (contingent) relations between universals.

Armstrong, D M. "Universals and Scientific Realism: Nominalism and Realism", Vol I.", Cambridge univ pr : Cambridge, 1978

Different versions of nominalism are considered and criticized, together with the view that properties and relations are particulars, not universals. The view that particulars are reducible to bundles of universals is also rejected. It is concluded that particulars and universals (properties and relations) are irreducible to each other, but only found together in states of affairs. The world-hypothesis is put forward that nothing exists except such states of affairs.

Armstrong, D M. "Towards a Theory of Properties.", Philosophy . 1975; 50,145-155

Realism about universals has characteristically been an a priori realism. Each one-place predicate with a distinct meaning which applies to a particular has been thought to generate its own distinct property. I reject this link between meanings and properties. Against a priori realism I uphold a scientific realism. What properties (and relations) particulars have ought to be determined a posteriori by the methods of natural science. I am currently engaged upon a large-scale working out of this theme, and this paper is a first report on some of the conclusions which have been reached.

Armstrong, D M. "Infinite Regress Arguments And The Problem of Universals.", Australasian Journal of Philosophy. 1974; 52,191-201

What is it for a particular to have a property? Many proposed analyses of this situation may be called relational accounts. The particular has some relation, r, to some entity p. r may be the relation of falling under, being a member of, resembling or "participating." p may be a predicate, a concept, a class, a paradigm instance or a form. A number of arguments seek to prove that all these accounts are involved in various vicious infinite regresses. These arguments are classified, their resemblances and differences noted, and their soundness assessed.

Aune, Bruce. "Armstrong on Universals and Particulars" in "D M Armstrong", Bogdan, Radu J (Ed), 161-170. (Reidel : Boston, 1984)

Aune, Bruce. "on Postulating Universals.", Canadian Journal of Philosophy. 1973; 3,285-294

Although philosophy has undergone a number of revolutions since the turn of the century, the existence of universals is still debated largely in the terms employed by moore and russell around 1910. The article contains a critical evaluation of the case alan donagan makes for what he takes to be russell's principal argument for universals. The general conclusion of the article is that the most plausible strategy for defending a commitment to universals actually raises more problems than it promises to solve.

Bacon, John. "Universals and Property Instances: The Alphabet of Being", Blackwell : Cambridge, 1995

Universals are bundles of like property instances, or tropes. Individuals are chains of bundles of i-concurrent tropes (i = 1,...). A possible world is any set of tropes together with a likeness and a concurrence relation. Thus some tropes may not be in the actual world. The hypothesis is defended that tropes are ontologically basic, "the very alphabet of being", in D C Williams's phrase. But they could be structured complexes of some sort, such as possible facts. The resulting theory is extended to relational tropes, compound universals, and modality and applied to belief, time, causation, and obligation.

Bacon, John (ed). "Properties and Predicates in Ontology, Causality and Mind: Essays in Honour of D M", Mellor, D H   (Cambridge Univ Pr : New York, 1993)

I argue first that the universals -- properties and relations -- that exist are those quantified over in a ramsey sentence stating all laws. I then use the predicate is red' to show how slight and complex the relation is between the meanings of predicates generally and the universals whose effects cause us to apply these predicates correctly.

Bacon, John (ed); Campbell, Keith (ed); Reinhardt, Lloyd (ed). "Ontology, Causality and Mind: Essays in Honour of D M Armstrong", Cambridge Univ Pr : New York, 1993

This Festschrift is a collection of papers on questions central to the philosophy of D M Armstrong, each followed by a reply from Armstrong. Topics covered include universals, dispositions, the combinatorial approach to modality, individuation, causality, laws of nature, consciousness, and color. The contributors are William G Lycan, David Lewis,

Peter Forrest, John Bigelow, D H Mellor, Evan Fales, J J C Smart, C B Martin, Peter Menzies, Frank Jackson, and Keith Campbell. A complete bibliography of Armstrong's works up to 1992 closes the book.

Bacon, John. "Armstrong's Theory of Properties.", Australasian Journal of Philosophy. 1986; 64,47-53

d m armstrong's theory of monadic universals lays down the "a priori" conditions under which one-place predicates 'p' (simple or complex) stand for properties, which the author expresses as 'up'. Armstrong's conditions for universalhood are systematized as a set of rules of inference governing 'u'. Four successively richer logical bases are used: quantifier-free monadic predicate calculus, monadic predicate calculus, monadic quantified s5, and monadic second-order quantified s5. An explicit definition of 'u' is also given in a modal version of quine's 1969 set theory. The formalization reveals that armstrong's principle of rejection of disjunctive universals must be weakened, and that his implicit assumption of conjunctive simplification inside 'u' is untenable. The resulting theory of properties is of interest as a systematic development of the widely shared intuition that negations and disjunctions of properties do not in general count as real properties.

Baylis, Charles A. "Universals, Communicable Knowledge, and Metaphysics.", Journal of Philosophy. 1951; 48,636-643

The position that there are unchanging characters or universals is presented in this article with the following characteristics: (1) the same character can be thought of again and again, (2) the character can be exemplified repeatedly, (3) certain relations obtain among the characters. This article begins by pointing out problems with nominalism and progresses to an explanation of the author's theory.

Bealer, George. Universals. *Journal of Philosophy*. 1993; 90(1), 5-32

Bigelow, John; Pargetter, Robert, "a Theory of Structural Universals", Australasian Journal of Philosophy. 1989; 67,1-11

Bigelow, John. Towards Structural Universals. *Australasian Journal of Philosophy* 1986; 64,94-96.

Bigelow, John. "Semantic Nominalism.", Australasian Journal of Philosophy. 1981; 59,403-421

A nominalist needs to explain how the meanings of complex expressions are determined by the meanings of their components. Can this be done, without appeal to either universals or sets? Two strategies are required. Firstly, we need to interpret a language by a one-many "signification" relation, relating each symbol to several things, rather than to a single "semantic value" (a universal, or set). Secondly, some symbols of the language (functors) should be interpreted by semantic relations holding between other symbols and things in the world. It is proved that for any set-theoretical semantics in a broad class,

there is a nominalistic theory which is in a specifiable sense equivalent to it. But the converse does not hold. The phenomena of referential opacity are easily accommodated in nominalistic, but not in standard semantics. Thus even believers in universals or sets have reason to do their semantics nominalistically.

Bochenski, I M; Church, Alonzo; Goodman, Nelson. "The Problem of Universals: a Symposium.", NOTRE DAME UNIV PR : NOTRE, 1956

The three papers brought together here were presented at the notre dame aquinas symposium, march 9-10, 1956. Alonzo church's paper is a brief, partly historical, study of various understandings of "propositions and sentences." nelson goodman gives a well-written exposition and defense of his version of nominalism in "a world of individuals." father bochenski's title essay alone is concerned with "the problem of universals"; this he breaks up into several levels and attempts to restate in terms of symbolic logic and with reference to the ontological commitments implied in the various positions.

Bogdan, Radu J (Ed). "D M Armstrong.", Reidel : Boston, 1984

The volume surveys and critically examines david armstrong's philosophical work on perception, belief, knowledge, mind, universals and laws of nature. The volume opens with armstrong's self-profile, which is an autobiographical survey of his intellectual life and work. Then d sanford, d rosenthal, s stich, w lycan, b aune, m tweedale, and j earman examine and evaluate armstrong's views on the above mentioned topics. The volume concludes with armstrong's replies on up-to-date, definitive bibliography of armstrong's works. The most important of these works have been summarized by their author.

Bouwsma, O K. Russell's Argument on Universals. Philosophical Review. 1943; 52,193-199

Butchvarov, Panayot Krustev. Resemblance and Identity; an Examination of the Problem of Universals. Indiana univ pr : London, 1966

Campbell, Keith. "Abstract Particulars", Blackwell : Cambridge, 1990

This book takes up, defends, and elaborates D C Williams's thesis that the fundamental ontological category is that of abstract particulars, that is, particular cases of qualities and relations. It provides a new resemblance treatment of the problem of universals, and argues that relations can be regarded, in most if not quite all cases, as supervenient on their terms. Considerations from first philosophy are presented as supporting a field theory of the natural world, and the benefits of abstract particularism for the human sciences briefly indicated.

Campbell, Keith. "Abstract Particulars and the Philosophy of Mind.", Australasian Journal of Philosophy. 1983; 61,129-141

This paper takes up the ontological proposal of d c williams, that the basic elements consist in cases, or examples, of kinds. Such elements, called "tropes", are abstract in that

they do not exhaust the reality where they exist (as concrete particulars do), and they are particular in having a reality restricted to a single space-time location (unlike universals). The system of tropes is applied to three important issues in the functionalist philosophy of mind; the question of type-type vs token-token identification, the problem of the existence of qualia and the issue of reductive vs eliminative materialism. The paper argues that token-token identification must give way to a realization relation between specific types. It agrees with jackson that qualia cannot be dissolved away into function, as lycan attempts, nor into opaquely grasped constitution, as urged by the churchlands, but that this result is not embarrassing on a trope philosophy. Finally, it argues that the reduction/elimination controversy is untroublesome from the trope perspective.

Campbell, Keith. "The Metaphysic of Abstract Particulars.", Midwest Studies in Philosophy. 1981; 6,477-488

This paper argues that instances or cases of properties (abstract particulars) can be individuals in their own right, and that to take them as the basic category of entities leads to attractive analyses of causation, perception, and evaluation. A first philosophy based on abstract particulars can give an elegant account of concrete individuals, and can make some progress with the classic problem of universals. The role of space in this metaphysic is discussed, a philosophy of change sketched out, and the system recommended on the ground of its affinity with contemporary cosmology.

Carroll, John W. "Ontology and the Laws of Nature.", Australasian Journal of Philosophy. 1987; 65,261-276

An argument for realism (i.e., the ontological thesis that there exist universals) has emerged in the writings of david armstrong, fred dretske, and michael tooley. These authors have persuasively argued against traditional reductive accounts of laws and nature. The failure of traditional reductive accounts leads all three authors to opt for a non-traditional reductive account of laws which requires the existence of universals. In other words, these authors have opted for accounts of laws which (together with the fact that there are laws) entail that realism is true. This argument for realism which emerges from the work of armstrong, dretske, and tooley is discussed and criticized. Conclusions from the discussion question the tenability of all reductive accounts of laws.

Casullo, Albert. "the Contingent Identity of Particulars and Universals.", Mind. 1984; 93,527-541
The primary purpose of this paper is to argue that particulars in the actual world are nothing but complexes of universals. I begin by briefly presenting bertrand russell's version of this view and exposing its primary difficulty. I then examine the key assumption which leads russell to difficulty and show that it is mistaken. The rejection of this assumption forms the basis of an alternative version of the view which is articulated and defended.

Casullo, Albert. "Particulars, Substrata, and the Identity of Indiscernibles.", Philosophy of
Science. 1982; 49,591-603

This paper examines the view that ordinary particulars are complexes of universals.
Russell's attempt to develop such a theory is articulated and defended against some
common misinterpretations and unfounded criticisms in section one. The next two
sections address an argument which is standardly cited as the primary problem
confronting the theory: (1) it is committed to the necessary truth of the principle of the
identity of indiscernibles; (2) the principle is not necessarily true. It is argued in section
two that a proponent of the theory need not accept (1) and an argument against (2) is
presented in section three. The final section attempts to show that russell's theory
ultimately fails because of inadequacies in its treatment of space and time. The paper
closes with a suggestion for remedying this difficulty.

Casullo, Albert. "Unexemplified Universals and Possible Worlds.", Philosophical Studies. 1981;
40,195-198

One of the chief disputes among realists is over the question of the relationship between
universals and the concrete objects which exemplify them. M j loux has invoked the
framework of possible worlds to argue both that there are universals which conform to
the aristotelian account and that there are universals which conform to the platonist
account. The purpose of this paper is to show that neither of these claims has been
substantiated.

Chihara, Charles S. "Our ontological commitment to universals.", Nous. 1968; 2,25-46

In this paper, the author traces and examines a line of reasoning which, evidentally, led
quine to accept platonism. Central to this reasoning is the thesis that mathematics--at least
the mathematics needed in science--is 'ontologically committed' to universals or abstract
entities; and part I of this paper is concerned primarily with this thesis. Thus the author
examines and criticizes in some detail various versions of quine's criterion of ontological
commitment. In part ii, the author sketches a line of reasoning in support of platonism
very similar to quine's but without resorting to quine's criterion or even making use of the
notion of ontological commitment. The author concludes by briefly discussing some
ways of avoiding the platonic conclusion.

Cocchiarella, Nino B. ""Philosophical Perspectives on Formal Theories of Predication" in
Gabbay, D (Ed), 253-326.. "Handbook of Philosophica" (Kluwer : Dordrecht, 1989).
Different formal theories of predication are associated with nominalism, conceptualism
and realism as theories of universals. Two different formal theories are associated with
conceptualism, depending on whether concepts are assumed to be formed only
predicatively (under the constraint of the vicious circle principle) or impredicatively as
well. Two different formal theories are also associated with realism, one Platonistic
(logical realism), the other Aristotelian (natural realism), with each validating different
versions of essentialism, but only natural realism also validating a logic of natural kinds.

All of the formal theories are described as second-order logics, with only the logic of nominalism being based on a substitutional interpretation of predicate quantifiers.

Cocchiarella, Nino. "On the Logic of Nominalized Predicates and its Philosophical Interpretations.", Erkenntnis. 1978; 13,339-369

By extending the well-formedness conditions for the wffs of standard second order logic so as to allow for the occurrence of nominalized predicates, a number of different logics for nominalized predicates are described and associated with different traditional philosophical theories of universals. E.g., since for the platonist universals are individuals (in the logical sense), the platonist takes a nominalized predicate to refer as a singular term to the same universal designated by that predicate in predicate position, i.e., when used predicatively. Universals are unsaturated entities for a fregean, however, and not individuals; and so the fregean, who retains the framework of standard second order logic takes a nominalized predicate to refer to an object correlated with the universal designated by that predicate. Abailardians resemble fregeans but differ in their interpretation of subject position quantifiers insofar as nominalized predicates do not refer at all as singular terms; and nominalists, who interpret predicate quantifiers substitutionally, resemble abailardians but with an additional restriction regarding quantification into predicate positions.

Cresswell, M J. "What Is Aristotle's Theory of Universals?", Australasian Journal of Philosophy. 1975; 53,238-247

Aristotle's theory of universals is expounded by contrast with plato's. Where plato had said that x is f iff x participates in the form of f, aristotle has two analyses. If f is a substance predicate then x is f iff x is specifically identical with an f. if f is an accidental predicate then x is f iff there is a y in x which is specifically identical with an individual in the appropriate category for f.

Crockett, Campbell. Contemporary Interpretations of the Problem of Universals. Philosophical Review. 1954; 63,241-249

Cusmariu, Arnold. "on an Aristotelian Theory of Universals.", Australasian Journal of Philosophy. 1979; 57,51-58

I examine an aristotelian solution to the problem of universals proposed by m j cresswell ("what is aristotle's theory of universals?", "the australasian journal of philosophy", volume 53, 1975, pages 238-247). The solution is inadequate in too many respects to be a worthwhile alternative to platonism: it cannot explain several prominent types of predicates (relational, extensionless, negative, unique, essentially unique, for example). As for the cases it can handle, the solution is circular in the way a coherence theory of justification is--I compare the metaphysical and epistemological enterprises on this score at the end.

Daly, Chris. "Tropes", Proceedings of the Aristotelian Society. 1994; 94, 253-261

> In this paper I counter the chief arguments for trope theory in Keith Campbell's book "Abstract Particulars". I argue that trope theory faces a version of Russell's resemblance regress, and therefore that it cannot dispense with universals. As a corollary, not all entities can be analyzed in terms of tropes, and so trope theory lacks the explanatory power Campbell credits it with. I further argue that trope theory needs instantiation relations to tie tropes into complex bundles, and therefore that trope theory is not more economical than the theory of universals.

Denkel, Arda. "Resemblance Cannot be Partial Identity", Philosophical Quarterly. 1998; 48(191), 200-204

> I demonstrate that analyzing the resemblance of properties in terms of partial identity has insuperable logical consequences. It follows that the strategy of vindicating the realism of universals against particularistic ontologies such as tropism by appeal to partial identity is incoherent.

Denkel, Arda. "Object and Property", Cambridge Univ Pr : New York, 1996

> The author develops a unified ontology of objecthood, essences and causation. A principal tenet is that while the basic units of the physical world are substances, particular properties are the analytic ultimates of existence. Although properties must inhere in objects, individual things are nothing more than compresences of properties at particular positions. There exist no mysterious substrata. Principles explaining how properties are held together in compresences are basically the same as those that account for essences and for causal relations. There exist no objective universals. Denkel defends a thoroughgoing particularism and offers purely qualitative accounts of individuation, identity, essences and matter. Throughout, the main alternative positions are surveyed and the relevant historical background is traced.

Eberle, Rolf A. "Nominalistic Systems.", REIDEL : DORDRECHT, 1970

> Various calculi of individuals (atomistic and non-atomistic systems of either unordered or sequential individuals) receive axiomatic, semantic, and philosophical treatment with special reference to nelson goodman. Alternative criteria regarding ontological implications are stated, proposed, and discussed. Nominalistic models, which avoid universals as designata of predicates, are used to define truth and validity for systems (often shown to be complete) which seem appropriate to qualities, bundles of qualities, or concreta, or formalize the notions of partial qualitative identity and of resemblance.

Ewing, A C. The Problem of Universals. Philosophical Quarterly (Scotland). 1971; 21,207-216

Fales, Evan. "Generic Universals.", Australasian Journal of Philosophy. 1982; 60,29-39

In "a theory of universals", david armstrong has proposed a theory to account for the resemblance of universals--the fact that determinate properties fall into natural groups or classes. According to armstrong, this important fact is explained in terms of partial identity. Two universals fall under a common genus if a single universal is a part of each. Although the author is in agreement with major aspects of armstrong's theory of universals, he thinks this explanation is mistaken. There are cases it does not account for. He proposes a general theory of generic universals, according to which such universals exist and bear a special relationship to their determinate species. If a particular has a certain determinate property, then it necessarily has each of the determinable properties under which the former falls. The necessary connection between determinate and determinables bears some resemblance to that between, e.g., color-properties and spatial extensions.

Freddoso, Alfred J. "Abailard on Collective Realism.", Journal of Philosophy. 1978; 75,527-538

In the "logica ingredientibus" abailard attacks the theory according to which universals are collections of individuals. I argue that abailard's principal objection to this 'collective realism', viz, that it conflates universals with integral wholes, is actually quite strong, though it is generally overlooked by recent commentators. For implicit in this objection is the claim that the collective realist cannot provide a satisfactory account of predication. The reason for this is that integral wholes are not uniquely decomposable. In support of my thesis I first explicate the medieval distinction between integral and subjective parts and then discuss its application to collective realism.

Forge, John. "Bigelow and Pargetter on Quantities", Australasian Journal of Philosophy. 1995; 73(4), 594-605

It is argued that the relations of proportion introduced by Bigelow and Pargetter should be excised from their theory of quantity. Retaining the nation that quantities comprise numerical relations, I include a binary composition operation and identify a quantity with the corresponding structure of universals. I describe this further with seven (obvious) axioms.

Forrest, Peter. "Neither Magic Nor Mereology: a Reply to Lewis.", Australasian Journal of Philosophy. 1986; 64,89-91

This is a reply to david lewis's "against structural universals" (same issue). The author examines the thesis which lewis relies on in his article, and which the author calle's the either mereology or magic thesis. He argues (1) that it does not follow from a conceptual analysis, (2) although it has considerable prima facie appeal it is not robust enough to be used to argue against structural universals, and (3) lewis himself is committed to counterexamples to it.

Forrest, Peter. "Bradley and Realism about Universals.", Idealistic Studies. 1984; 14,200-212

In this paper I adapt bradley's argument of chapter two of "appearance and reality", in order to establish a presumption against what I call hard realism about universals. By that I mean the treatment of universals as sufficiently like particulars to be called "things", without hesitation. I leave open the possibility of overcoming this presumption.

Fotinis, A P. "a Critical Evaluation of Universals in Nominalism.", Philosophia. 1973; 3,382-404

The purpose of this article is to show the solution of nominalism to the problem of universals, the indefensibility of its theory, and the incompatibility of universals with individuals of basic particulars. The solution is seen in the analysis of universals as a development of medieval nominalists, and as a treatment of hobbes, or as a reassertion of quine and goodman. Both the indefensibility and incompatibility are shown in the critical evaluations of such critics as russell, wittgenstein, bochenski, pears, strawson, and others. The final solution whether valid or invalid is that universals, according to abelard are general concepts which exist in singular things, while for ockham are concepts or general terms which exist only in thought. Nevertheless, the theory of nominalism in its strict sense is indefensible, since it considers only individuals, and therefore fails to utilize the concept of identity. Finally, universals are incompatible with individuals or basic particulars, because of their difference in consistency, content and existence.

Gibbons, Alan. "Landesman on Universals.", Philosophy and Phenomenological Research. 1975; 35,415-418

The paper is a response to Charles Lndesman's article in Philosophy and Phenomenological Research and provides a "reductio ad absurdam" of his argument for a realistic theory of universals.

Goodman, Nelson. 1951. *The Structure of Appearance*. (Indianapolis: Bobbs-Merrill).

Goodman, Nelson and Willard Van Orman Quine (1947) 'Steps towards Constructive Nominalism.' *Journal of Symbolic Logic* **12**: 97 - 122. Reprinted in Nelson Goodman, *Problems and Projects.* Indianapolis, IN: Bobbs-Merrill Co., 1872, pp. 173 - 99.

Grandy, Richard E. Universals or Family Resemblances? Midwest Studies in Philosophy. 1979; 4,11-17

Griffin, Nicholas. "Wittgenstein, Universals and Family Resemblances.", Canadian Journal of Philosophy. 1974; 3,635-651

Wittgenstein's concept of family resemblance, and its reformulation by keith campbell, are critically considered. The theory is criticized on a number of grounds but specifically on the ground that such a theory can give no explanation of why general terms are limited in applicability. The theory thus provides no solution to the traditional problem of universals. Renford bambrough's theory is considered as distinct from wittgenstein's and argued to be incoherent.

Haack, Susan. "Platonism Versus Nominalism: Carnap and Goodman.", Monist. 1978; 61,483-494

"The structure of appearance" is intended as a nominalist version of the "aufbau", for carnap employs set-theory in his construction, whereas goodman allows only mereology. But it is not clear that goodman's is the more nominalistic enterprise, for his basis is of repeatable universals (qualia), while carnap's is of unrepeatable particulars (elexes). The supposed ontological preferability of goodman's enterprise rests on the principle that two distinct entities cannot be made from the very same atoms; but this principle, I argue, at least once the type-token distinction is taken seriously, can be seen not to be acceptable.

Hochberg, Herbert. "Particulars, Universals and Russell's Late Ontology", Journal of Philosophical Research. 1996; 21, 129-137

Russell's late ontology sought to avoid "wholly colourless particulars" (substrata, points of space, bare instants of time) by appealing to complexes of compressent qualities in place of particulars that exemplify qualities. Yet he insisted on i) calling qualities like "redness" "discontinuous," "repeatable" particulars, and ii) claiming that such qualities were not universals, since they were not exemplified but were ultimate subjects that exemplified universal relations and universal qualities. It is argued that his choice of terminology is not only misleading, but is ironically not consistent with the concept of universality implicit in his well-known "proof" of the existence of universals, a proof he retained in his later (1940-48) ontology. It is also argued that there are substantive grounds for rejecting his classification that clarify the concept of a universal.

Hochberg, Herbert "Particulars "as" Universals: Russell's Ontological Assay of Particularity and Phenomenological", Journal of Philosophical Research. 1995; 20, 83-111

Russell's elimination of basic particulars, in "An Inquiry into meaning and Truth" and "Human Knowledge: Its Scope and Limits", by purportedly construing them as "bundles" or "complexes" of universal qualities has been attacked over the years by A J Ayer, M Black, D M Armstrong, M Loux, and others. These criticisms of Russell's ontological essay of "particularity" have been based on misconstruals of his analysis. The present paper interprets Russell's analysis, rebuts arguments of his critics, and sets out a different criticism of "bundle" analyses of particulars of the Russellian kind.

Hochberg, Herbert. "Ontology and Acquaintance.", Philosophical Studies. 1966; 17,49-54

The article attempts to throw light on question of whether a principle of acquaintance is a guide in ontology. The author examines views of both those who claim to be acquainted with such things as substrata or universals and those who hold that they are acquainted only with phenomena (qualities). He argues that the principle of acquaintance functions to differentiate between qualities, but does not give assurance that one is acquainted with universals. He concludes that adherence to the principle of acquaintance forces one to abandon substrata.

Hochberg, Herbert. "Universals, Particulars, and Predication.", Review of Metaphysics. 1965; 19,87-102

The author contends that the radical differences between the arguments that lead to the acceptance of particulars and those that lead to universals reveal the former to be specious. To support his thesis, he defines and examines three conflicting views on the problem of universals. He also considers the ontological ties of exemplification and combination postulated by these positions and discusses the nature of relational properties.

Jackson, Frank. "Statements about Universals.", Mind. 1977; 86,427-429

Nominalists have attempted to translate statements putatively about universals--like 'red is a colour'--into statements about particulars alone. In this note I reinforce and supplement extant realist arguments against such attempts.

Lehrer, Keith; McGee, Vann. "Particulars, Individual Qualities, and Universals in Language, Truth and Ontology, Mulligan," Kevin (ed) (Kluwer : Dordrecht, 1992).

This article develops Thomas Reid's theory of individual qualities and universals connecting his theory with recent work. Reid held that individualities, now called tropes, were the basis for our general conceptions of universals which, however, are not things that exist. His theory is related to prototype theory in psychology and to nominalist ontology.

Lewis, David. "Comment on Armstrong's "In Defence of Structural Universals" and Forrest's "Neither Magic" Nor Mereology"., Australasian Journal of Philosophy. 1986; 64,92-93

The author had complained against structural universals that (on the otherwise most satisfactory conception) they violate a principle of uniqueness of composition; Armstrong and Forrest replied that a friend of universals would in any case reject that principle, because it is violated also by structures composed of universals plus particular instances thereof. To this the author says that the friend of universals might get by without the structures; whether he can depend on what work he wants his theory to do, in particular on whether he requires it to provide truthmaking entities for all truths.

Lewis, David. "Against Structural Universals.", Australasian Journal of Philosophy. 1986; 64,25-46

A structural universal is one such that, necessarily, any instance of it consists of proper parts that instantiate certain simpler universals in a certain pattern. Forrest has suggested that structural universals could serve as ersatz possible worlds; armstrong has offered several reasons why a theory of universals must accept them. The author distinguishes three conceptions of what a structural universal is, and raises objections against structural universals under all three conceptions. The author then considers whether uninstantiated structural universals, which are required by forrest's proposal, are more problematic than instantiated ones.

Lewis, David. "New Work for a Theory of Universals.", Australasian Journal of Philosophy. 1983; 61,343-377

D M Armstrong puts forward his theory of universals as a solution to the problem of one over many. But this problem, depending on how we understand it, either admits of nominalistic solutions or else admits of no solution of any kind. Nevertheless, Armstrong's theory meets other urgent needs in systematic philosophy: its very sparing admission of genuine universals offers us a means to make sense of several otherwise elusive distinctions.

Lewis, David, and Stephanie Lewis. 1970. "Holes", *Australasian Journal of Philosophy* **48**: 206-212. Reprinted in David Lewis, *Philosophical Papers, v. 1* (New York: Oxford University Press, 1983).

Linsky, Bernard. "Propositional Functions and Universals in "Principia Mathematica"." Australasian Journal of Philosophy. 1988; 66,447-460

The propositional functions of the first edition of "principia mathematica" are different from the universals in "the problems of philosophy". Propositional functions were to be logical constructions out of propositions which in turn were to be logical constructions out of particulars and universals. While the theory of types is primarily a classification of propositional functions, russell also held that universals differ in type from particulars. No well-formed term of pm stands for a universal; the closest one can come is an expression for a propositional function.

Lloyd, A C. "on Arguments for Real Universals.", Analysis. 1951; 11,102-107

The purpose of the article is to suggest that arguments for universals from "ordinary discourse are probably invalid," but a case may be made for an exposition from mathematical discourse. The author investigates the former claim and alludes to the latter.

Lowe, E J. "The Metaphysics of Abstract Objects", Journal of Philosophy. 1995; 92(10), 509-524

Two rival answers to the question "What is an object?" are examined, one semantic and the other metaphysical. The latter is defended, this holding that objects are entities possessing determinate identity conditions. Entities may be "abstract" either in being nonspatiotemporal, or in being logically incapable of enjoying a "separate" existence, or in being dependent upon abstraction from concepts. "Universals" and "sets" are abstract objects in the first two senses and their existence can be defended via explanatory considerations.

Lowe, E J. "Are the Natural Numbers Individuals or Sorts?", Analysis. 1993; 53(3), 142-146

The natural numbers are abstract entities, but universals rather than particulars. They are not sets, but kinds whose instances are sets. Thus 2 is the kind of two-membered sets. This view accords well with our ordinary talk about numbers and avoids problems like Benacerraf's about the identity of the numbers. Since kinds are not themselves sets, no circularity ensues from saying that 2 can itself be a member of a set which is an instance of 2.

Mccloskey, H J. "the Philosophy of Linguistic Analysis and the Problem of Universals.", Philosophy and Phenomenological Research. 1964; 24,329-338

It is argued that linguistic analysis does not deal with the problem of universals in a satisfactory way. The contributions of ryle, wittgenstein and pears are considered. It is held that the problem of universals is a genuine metaphysical problem and does not admit of being disposed of by conceptual analysis. Moreover, the failure of attempts by linguistic analysts here must cast doubt on the soundness of their bold antimetaphysical claims. It is concluded that the problem of universals is not primarily one of naming, but rather of resemblances.

Mcclure, George. "Resemblance and Purpose.", Philosophy and Phenomenological Research. 1964; 25,180-187

I argue that a full account of the logic of resemblance statements requires the use of second-order predicates, giving the respect in which the resemblance is to be noted. Thus, "x resembles y" gets expanded into, "x resembles y with respect to some f." I then show that the full explication of what is involved in the statement of this third, or context-conferring term, must include values: the purposes for which the resemblance is to be noted. Though not explicitly argued, the article was designed to illustrate the utility of the assumption of the existence of universals.

Meixner, Uwe. "On Negative and Disjunctive Properties" in Language, Truth and Ontology, Mulligan, Kevin (ed) Kluwer : Dordrecht, 1992

The paper is a defense of negative and disjunctive properties against the criticism of D M Armstrong in part II of "Universals and Scientific Realism". Given a mereology of properties (properties which are parts of properties) there must be negative and disjunctive properties. Moreover, negations of properties can be causally efficacious, and disjunctions of properties can be identical in different particular; they fulfill Armstrong's own criteria for propertyhood; Hence they are properties in his sense.

Moore, G. E. 1923. "Are the Characteristics of Particular Things Particular or Universal?", *Aristotelian Society, Supplementary Volume* 3.

Moreland, J P. "Nominalism and Abstract Reference", American Philosophical Quarterly. 1990; 325-334

I focus on the debate about the nature of qualities between nominalists (qualities are abstract particulars) and realists (qualities are universals) by examining abstract reference. Realists claim that sentences like (1) "red resembles orange more than it does blue" and (2) "red is a color" incorporate abstract singular terms, e.g., "red," that refer to universals. Nominalists try to account for (1) and (2) by employing two basic strategies: abstract singular terms refer to sets of abstract particulars or reductive paraphrase. Both strategies are examined and rejected. Sentences like (1) and (2) provide evidence for a realist assay of qualities.

Moreland, J P. "Keith Campbell and the Trope View of Predication", Australasian Journal of Philosophy. 1989; 67(4),379-393

After comparing extreme nominalism (qualities do not exist), nominalism (qualities are abstract particulars called tropes), and realism (qualities are universals), I focus on the nominalist views of Keith Campbell. His understanding of a nominalist assay of qualities and quality-instances is stated and subjected to criticism. The criticisms center on Campbell's use of the distinction of reason to analyze a trope. I conclude that Campbell's views are incoherent.

Mortensen, Chris. 1987. "Arguing for Universals.", Revue Internationale de Philosophie. 1987; 41,97-111

Mundy, Brent. "the Metaphysics of Quantity.", Philosophical Studies. 1987; 51,29-54

A formal theory of quantity "t $_q$ " is presented which is realist, platonist, and syntactically second-order (while logically elementary), in contrast with the existing formal theories of quantity developed within the theory of measurement, which are empiricist, nominalist, and syntactically first-order (while logically non-elementary). "T $_q$ " is shown to be formally and empirically adequate as a theory of quantity, and is argued to be scientifically superior to the existing first-order theories of quantity in that it does not depend upon empirically unsupported assumptions concerning existence of physical objects, e.g., that any two actual objects have an actual sum. The theory "t $_q$ " supports and illustrates a form of "naturalistic platonism", for which claims concerning the existence and properties of universals form part of natural science, and the distinction between accidental generalizations and laws of nature has a basis in the second-order structure of the world.

Nerlich, Graham. "Universals: Escaping Armstrong's Regresses.", Australasian Journal of Philosophy. 1976; 54,58-64

Armstrong's regress arguments depend on his claim that the analysans of any analysis will contain a general term which must itself be subjected to the analysis. This feature of analysis may be avoided by laying down conditions of adequacy which any analysis

should meet. The conditions actually suggested in the paper make clear the structural reasons why platonic styles of analysis might seem congenial.

Newman, Andrew. "The Physical Basis of Predication", Cambridge Univ Pr : New York, 1992

This is a book about some of the basic concepts of metaphysics: universals, particulars, causality and possibility. Its aim is to give an account of the real constituents of the world. The author defends a realistic view of universals, characterizing the notion of universal by considering language and logic, possibility, hierarchiesof universals, and causation. On the other hand, he argues that logic and languages are not reliable guides to the nature of reality.All assertions and predications about the natural world are ultimately founded on "basic universals", which are the fundamental type of universal and central to causation. A distinction is drawn between unified particulars (which have a natural principle of unity)and arbitrary particulars (which lack such a principle); unified particulars are the terms of causal relations and thus real constituents of the world. Arbitrary particulars such as events, states of affairs, and sets have no ontological significance.

Newman, Andrew. "The Material Basis of Predication and Other Concepts.", Australasian Journal of Philosophy. 1988; 66,331-347

immanent realism is a justly popular theory of universals which is incomplete. It is not good enough to say that all universals are equally real and all equally inhere in objects. Concepts come in hierarchies, for example: "colored," "red" and "claret," where "claret" is a shade of red. Only those at the very bottom of the hierarchy exist in objects, and are rightly called properties. Only properties have causality as a criterion of identity. Frege's functional account of concepts can be adapted to explain how higher level concepts apply to objects. Between two concepts at different levels there is a relationship called 'essential subordination', which is different from all other relationships. That a person is said to possess a concept of a property is to be explained in terms of a person possessing certain mental capacity, which enables him to make certain judgments. Properties are concepts which exist in objects.

O'connor, D J. "Names and Universals." Proceedings of the Aristotelian Society. 1953; 53,173-188

O'connor, D J. Stout's Theory of Universals. Australasian Journal of Philosophy. 1949; 27,46-69

The author discusses stout's contention that there is a natural unity to the universe. Stout "holds that the unity of a class or kind,... is just another one of these forms." stout's criticisms of the traditional logical theory and nominalism are examined. The author concludes that "universals must be found "in experience" in order that they may enable us to think beyond the limits of the here-and-now."

O'Leary Hawthorne, John; Cover, J A. "A World of Universals", *Philosophical Studies* 1998; 91(3), 205-219

Oddie, Graham. "Armstrong on the Eleatic Principle and Abstract Entities.", Philosophical Studies. 1982; 41,285-295

David armstrong has claimed (in "universals and scientific realism") that there is "a single, very powerful line of argument" for dispensing with a large number of abstract entities. The central premise of armstrong's argument is the "eleatic principle," that what does not possess causal efficacy is not real. In this paper it is argued, firstly, that it is extremely difficult to find an unobjectionable version of the principle, and, secondly, that using the most acceptable version of the principle the argument does not go through.

Oliver, Alex. 1996. "The Metaphysics of Properties", *Mind* 105: 1-80.

Pap, A. Nominalism, Empiricism, and Universals -ii. Philosophical Quarterly. 1960; 10,44-60

Pap, A. Nominalism, Empiricism, and Universals -i. Philosophical Quarterly. 1959; 9,330-340

Parsons, Josh. 1999. "There is no 'Truthmaker' Argument against Nominalism", *Australasian Journal of Philosophy* 77, 325-334

In his two recent books on ontology, "Universals: an Opinionated Introduction", and "A World of States of Affairs", David Armstrong gives a new argument against nominalism. That argument seems, on the face of it, to be similar to another argument that he used much earlier against Rylean behaviorism: the truthmaker argument, stemming from a certain plausible premise, the truthmaker principle. This paper argues that Armstrong's new argument is not logically analogous to the old, and that it is quite possible to be a thoroughgoing or 'ostrich' nominalist while holding the truthmaker principle. It also puts forward a general characterization of the principle, as it might be held by such a nominalist.

Pautz, Adam. "An Argument against Armstrong's Analysis of the Resemblance of Universals", Australasian Journal of Philosophy. 1997; 75(1), 109-111

Pears, David. Universals. Philosophical Quarterly. 1951; 1,218-227

Peterson, Philip P. "Revealing Designators and Acquaintance with Universals.", Nous. 1986; 20,291-311

The view that universals are meaning-like entities is defended. Meaning and reference of abstract singulars is discussed in order to combat objections to identifying meanings and universals, resulting in the definition of a "revealing (rigid) (property) designator" (one such that knowing what it means guarantees knowing what it refers to, though referent and meaning remain distinct). Application of this definition clears up some vagueness in Kripke's account of reference and helps explain how direct acquaintance with instances of a universal produces knowledge of word meanings. Property individuation via meanings (and "vice versa"), natural kind terms (which are usually "not" revealing

designators), and some non-existing universals (to solve some paradoxes) are also discussed.

Quine, W V. "Soft Impeachment Disowned.", Pacific Philosophical Quarterly. 1980; 61,450-451

Armstrong deplores my alleged "ostrich nominalism," not perceiving that I, like him, espouse a realism of universals. I limit my universals to classes, but only because of the problem of individuating intensions and not from nominalist pretensions. His lack of a clear standard of what constitutes assumption of objects has the startling effect of reactivating bradley's old worry of a regress of relations.

Quine, W V. "Identity, Ostension, and Hypostasis.", Journal of Philosophy. 1950; 47,621-632

The problem of identity is discussed through an analysis of ostension of spatio-temporally extended objects. The author begins by explicating this system and then shows how it differs from the ostension of irreducible universals, such as "square" and "triangle." the author concludes by explaining that detachment from one's conceptual scheme is not possible, but the scheme can be changed "plank by plank" to correspond with a pragmatic standard.

Quine, W V. on Universals. Journal of Symbolic Logic. 1947; 12,74-85

Quine, W. V. O. 1939. "Designation and Existence", *Journal of Philosophy* 36: 701-709.

Russell, Bertrand. 1959. *The Problems of Philosophy*. (Oxford: Oxford University Press). First published in the Home University Library, 1912.

Raphael, D Daiches. Universals, Resemblance, and Identity. *Proceedings of the Aristotelian Society* 1955; 55,109-132

Rodriguez Pereyra, Gonzalo. "What Is the Problem of Universals?", Mind. 2000; 109(434), 255-273

In this article I address the problem of universals by answering questions about what facts a solution to the problem of universals should explain and how the explanation should go. I argue that a solution to the problem of universals explains the facts the problem of universals is about by giving the truth makers (as opposed to the conceptual content and the ontological commitments) of the sentences stating those facts. I argue that the sentences stating the relevant facts are those like ""a" has the property "F".

Schoedinger, Andrew B (ed). "The Problem of Universals", Humanities Pr : Atlantic Highlands, 1991

This anthology offers a comprehensive presentation of twenty-eight analyses of the problem of universals. It opens with analyses proposed by Plato and Aristotle and then provides selections from theviews of the medieval scholars Abeland, Aquinas, Duns

Scotus and Ockham. It them traces the development of Western thought on this fundamental topic from the modern through the contemporary period, and includes the work of Kant, Hegel, Husserl, Heidegger, Russell, Quine, Strawson, Carnap and Allaire.

Sellars, Wilfrid. "Abstract Entities.", Review of Metaphysics. 1963; 16,627-671

The author argues that although they are distinguishable from the specific materials (sign designs) which embody them in historically given languages, abstract entities are linguistic entities. In developing his theory of universals and propositions, which makes use of "distributive individuals" such as "man," he introduces notational devices, discusses frege's ideas on concepts, considers exemplification, and comments on the relations between abstract entities themselves.

Sider, Theodore. "Naturalness and Arbitrariness", *Philosophical Studies* **81** (1996): 283-301

Simons, Peter. "Ramsey, Particulars, and Universals", Theoria. 1991; 57(3), 150-161

Smith, Barry. "Substances, Accidents and Universals: In Defence of a Constituent Ontology"", Philosophical Papers. 1997; 26(1), 105-127

The essay constructs an ontological theory designed to capture the categories instantiated in those portions or levels of reality which are captured in our common sense conceptual scheme. It takes as its starting point an Aristotelian ontology of "substances" and "accidents", which are treated via the instruments of mereology and topology. The theory recognizes not only individual parts of substances and accidents, including the internal and external boundaries of these, but also universal parts, such as the "humanity" which is an essential part of both Tom and Dick, and also "individual relations", such as Tom's promise to Dick, or their current handshake.

Staniland, Hilary. Universals. City ny anchor books : Garden, 1972

Stevenson, L. "On What Sorts of Thing There Are.", Mind. 1976; 85,503-521

The claim is that ontological questions occur at three logically distinct levels: (1) the existential statements implied by a first-order theory; (2) the range of variables of a first-order language; and (3) the extra-linguistic correlates of a semantic theory. Examples would be, respectively, whether there is an even number which is not the sum of two primes, whether the analysis of action-sentences must involve quantification over events, and whether we must understand predicates as referring to universals. Close analysis of quine's writings reveals three such notions, not clearly enough distinguished.

Strawson, Peter. "Universals.", Midwest Studies in Philosophy. 1979; 4,3-10

The issue between nominalists and realists is unlikely ever to be rationally resolved. Currently favoured tests, leaning on the notions of reference and identity, do not yield a clear-cut way of resolving the issue. There is no neutral vantage-point from which to

determine whether the notion of existence should be restricted to what is found in nature or should be extended to include objects of thought exemplifiable but not locatable in nature.

Stroll, Avrum. Meaning, Referring, and the Problem of Universals. Inquiry. 1961; 4,107-122

The author begins by noting that the problem of universals often focuses upon the role which pronouns, common nouns, and adjectives play in languages. The author's thesis is "that questions about the roles which linguistic expressions play are often interpreted as questions about the meaning of these words, and these, in turn, are thought to be questions asking for the identification of differing sorts of objects in the universe (e.g., particulars, universals)." the author tries to show why such interpretations of ordinary questions are improper.

Stout, G. F. 1923. ?? *Proceedings of the Aristotelian Society* 3.

Teichmann, Jenny. Universals and Common Properties. Analysis. 1969; 29,162-165

Teichmann, Roger. "Three Kinds of Realism about Universals", Philosophical Quarterly. 1989; 39,143-165

The following positions are distinguished: (a) that both predicables and "property-names" refer to universals; (b) that predicables refer to universals while "property-names" don't; (c) that "property-names" refer to universals while predicables don't. Each position is discussed at length and found wanting. Insofar as the three views are exhaustive of traditional realism about universals, that too is found wanting; the legitimacy of higher-order quantification, however, remains unassailed.

Thompson, Manley. "Abstract Entities and Universals.", Mind. 1965; 74,365-381

The author argues that the identification of the realist's entities rests on a philosophical confusion. Specifically, he wants to argue that any plausible account of what we mean by "abstract entities" does not provide any account of what realists in the history of philosophy from plato through peirce have meant by "universals." after exposing the confusion that leads to the identification of abstract entities and universals the author gives reasons for dismissing the issue of nominalism versus realism as itself resting on confusion.

Tweedale, Martin. "Aristotle's Realism.", Canadian Journal of Philosophy. 1988; 18,501-526

A fairly strong case can be constructed for claiming that aristotle held a robust realism in which at least some universals are primary substances. But a closer look at the texts shows that, although aristotle is a realist, his realism is very tenuous in that each universal is just the many particulars that fall under it and thus lacks numerical unity. This interpretation relies on the notion that every particular in the natural world, including

particular forms, arises from an accidental predication and on applying to these particulars the equivalence relation of "being the same in species (genus) as."

Tweedale, Martin M. "Armstrong on Determinable and Substantial Universals" in "D M Armstrong", Bogdan, Radu J (Ed), 171-190. (Reidel : Boston, 1984)

Tweedale, Martin Middleton. "Abailard on Universals.", North holland : Oxford, 1976

This work shows how abailard elaborated and defended the view that universals are words, avoided the pitfalls of an image theory of thinking, and propounded a theory of "status" and "dicta" as objects of thought without treating them as subjects of predication. His defense of these views is shown to depend on certain fundamental departures from the aristotelian term logic of his day, including a proposal for subjectless propositions, the treatment of copula plus predicate noun as equivalent to a simple verb, and a transformation of the 'is' of existence into the 'is' of predication.

Urmson, J O ""Russell on Universals" in "Philosophers Ancient and Modern", Vesey, Godfrey (Ed), 245-258." Cambridge univ pr : Cambridge, 1986

This is an explanation of Russell's theory of universals for beginners. It gives his reasons for introducing the theory, shows how he used it to solve some philosophical problems, and criticizes his view of a separate world of universals as unnecessary for his purposes. Russell's assertion of universals of relations is emphasized.

Urmson, J O. Russell on Universals. Philosophy. 1986; 20,245-258

Van Cleve, James. "Predication Without Universals? A Fling with Ostrich Nominalism", Philosophy and Phenomenological Research. 1994; 54(3), 577-590

In this paper I consider the merits of Realist theories of predication vis- a-vis three varieties of nominalism, which Armstrong has dubbed predicate nominalism resemblance nominalism, and ostrich nominalism. In Part I, I argue that ostrich nominalism is the most satisfactory position of these four, and that the realist view favored by Armstrong and many others is prone to the same fundamental difficulty as the other two varieties of nominalism. In Part II, I consider difficulties for the argument of Part I.

Vision, Gerald. Searle on the Nature of Universals. Analysis. 1970; 30,155-160

Weissmann, H A. the Essence of Universals. Synthese. 1959; 11,277-293

Williams, Donald C. "Universals and Existents.", Australasian Journal of Philosophy. 1986; 64,1-14

Williams reviews the theory of tropes which he had presented in "on the elements of being," "review of metaphysics" 7 (1953): 3-18 and 171-92. He places that theory in the context of his view that "absolutely all there is is a four-dimensional plenum of qualia in

relations," subject to unrestricted mereology. He then asks how the existence of universals, repeated identically from instance to instance, might be reconciled with the trope theory. He retracts his earlier proposal that universals be equated with (or supplanted by) sets of resembling tropes. He adopts instead the "trope-kind theory" according to which universals simply "are" tropes, spoken of and counted under a "relaxed" notion of identity. He classifies the trope-kind theory as a form of immanent realism about universals.

Wolterstorff, Nicholas. *on Universals: an Essay in Ontology*.

In part I, N Wolterstorff distinguishes subjects from predicates and general terms from singular. In part ii he argues that there are non-linguistic predicable entities, defending the principle that "if something "is-f", then there is such a thing as "f-ity"." states and actions as well as properties, he says, are predicables. In part iii he maintains that such things as symphonies and books are universals: not predicable universals but "substance" universals. In part iv, wolterstorff denies that universals are either paradigms, exemplars or perfect copies of themselves.

Ontological Commitment

Alston, William P. "Ontological Commitments.", Philosophical Studies. 1958; 9,8-16

   This article considers the task of translating linguistic expressions, such as sentences of
   the form 'there are p's', to sentences of some other form. The author is especially
   concerned with the view that such translations enable us to avoid "ontological
   commitments." he takes an example from morton white which allegedly provides a case
   of a translation which avoids ontological commitments and argues that if the translation
   is adequate then it is used to make the same assertion as the original and so makes the
   same commitments. He concludes that those who take avoidance of ontological
   commitment as the point of linguistic translations are obstructing our view of the real
   point of such translations.

Anderson, Alan Ross.   Church on Ontological Commitment. Journal of Philosophy. 1959;
   56,448-451

Ayer, A J. "on What There Is, Part Ii.", Aristotelian Society. 1951; Suppl 25,137-148

Bonevac, Daniel A. "Reduction in The Abstract Sciences.", Hackett : Indianapolis, 1982

   This work argues for nominalism in the philosophy of mathematics and in metaphysics.
   Only by eliminating abstract objects via ontological reduction, it urges, can we reconcile
   ontology and epistemology. After developing an account of reduction for abstracta, it
   allays benacerrat's fear of multiple reductions and quine's fear of a world of numbers.
   Finally it presents a theory of ontological commitment, relating it to ontology in general
   and devising an epistemological criterion for ontic decision.

Boolos, George (1975) 'On Second-Order Logic.' *Journal of Philosophy* 72: 509 - 27.

Boolos, George (1984) 'To Be is to Be a Value of a Variable (or to Be Some Values of Some
   Variables).' *The Journal of Philosophy* 81: 430 - 49.

Carnap, Rudolf (1950) 'Empiricism, Semantics, and Ontology.' Reprinted as a supplement to
   Meaning and Necessity: A Study in Semantics and Modal Logic. Chicago: University of
   Chicago Press, 1956, pp. 205 - 21.

Church, Alonzo. Symposium: Ontological Commitment. Journal of Philosophy. 1958; 55,1008-
   1014

Colyvan, Mark. "In Defence of Indispensability", Philosophia Mathematica. 1998; 6, 39-62

   Indispensability arguments for realism about mathematical entities have come under
   serious attack in recent years. To my mind the most profound attack has come from

Penelope Maddy, who argues that scientific/mathematical practice does not support the key premise of the indispensability argument, that is, that we ought to have ontological commitment to those entities that are indispensable to our best scientific theories. In this paper I defend the Quine/Putnam indispensability argument against Maddy's objections.

Cooper, Neil. "Ontological Commitment.", Monist. 1966; 50,125-129

In this paper quine's criterion of ontological commitment is examined and rejected as incapable of distinguishing genuine from bogus ontological commitments. Applying quine's strict test for ambiguity, "exists" is shown to have two senses in application to properties, classes and numbers, a formal sense and a material sense. In the material sense, to say that a property exists is to say that it has instances; in the formal sense, to say that a property exists is to say that it is possible to use a property-expression meaningfully. The distinction is clarified by means of the notion of "semantic ascent." such ascent is essential for explaining the meaning of formal existence-statements. These are vacuous and do not genuinely commit one to the existence of anything. Quine's purely formal test does not reveal this and thus is responsible for setting spurious problems about "countenancing" abstract entities.

Creath, Richard. "Nominalism by Theft.", American Philosophical Quarterly. 1980; 17,311-318

A consistent interpretation of mathematical discourse is given in which numerals do not denote, and in which no ontological commitment is made to abstracta. The approach is formalistic, but unlike in historical versions of formalism, the usual theorems of pure mathematics are counted among the genuine truths rather than as mere marks. Applied mathematics is also investigated, and classical theories of measurement are developed into a semantics for sentences involving mathematical and non-mathematical terms.

Crittenden, Charles. "Ontological Commitments of Everyday Language.", Metaphilosophy. 1974; 5,198-215

Fictional characters are referred to but not conceived as existing, by speakers of everyday language. So the view that ordinary reference always presupposes existence, from which the inference is drawn that everyday language has a "bloated ontology," is mistaken. Thus it is not necessary to turn to scientific reference for a criterion for ontological commitment. Scientific references do generally denote existents, because science is an extension of "some" of the techniques conceived as dealing with reality. But there are other such techniques: everyday speakers employ a number of criteria for distinguishing fictions from real things, among them spatio-temporal location, perceivability, suffering and producing causal effects, and ability to think. These criteria admit existents of different kinds: a country, e.g., has a location and produces effects, though not perceivable and concrete.

Dako, Martin. "in Defense of Substitutional Quantification.", International Logic Review. 1986; 17,50-61

Quine's approach to ontological commitment even in natural language has been to employ objectual existential quantification. The ineliminability of singular referring expressions from natural language presents the challenge of presenting a type of substitutional interpretation of quantifiers, which turns out to be a defensible one. Statements in which ineliminable singular expressions occur can be interposed between quantified ones and reference to the nonlinguistic world in this version of substitutional quantification.

Divers, John; Miller, Alexander. "Minimalism and the Unbearable Lightness of Being", Philosophical Papers. 1995; 24(2), 127-139

Crispin Wright's case for arithmetical Platonism emerges in a refined version from his recent and important work on truth ("Truth and Objectivity"). In this paper we pursue the question of the adequacy of that general minimalist approach to ontology that supports Wright's arithmetical Platonism. We suspect that minimalism yields a conception of being which is at once too wide and too light to be acceptable. We articulate our suspicion by showing that the minimalist criteria of ontological commitment that sustain Wright's arithmetical Platonism will also secure an ontological commitment to fictional objects.

Geach, P T. on What There Is, Part I.   Aristotelian Society. 1951; Suppl 25,125-136

Gottlieb, Dale Ontological Economy. Clarendon pr : Oxford, 1980

Gottlieb, Dale; Mccarthy, Timothy. "Substitutional Quantification and Set Theory.", Journal of Philosophical Logic. 1979; 8,315-331

Our concern in this paper is to defend the use of substitutional quantification in set theory as a way of avoiding ontological commitment to sets. Specifically, two objections to this procedure are addressed. (1) charles parsons claims that substitutional quantification (at least in set theory) is not ontologically neutral, but rather expresses a "bona fide" sense of existence. We argue that he has failed to distinguish between meta-linguistic commitment to expressions on the one hand and ontological commitment to sets in the object language on the other. (2) t s weston claims that a substantial interpretation of the quantifiers of zermelo-frankel set theory (zf) is inconsistent with obvious theses of semantics. We argue that he has artificially limited the ways in which the quantification of zf can be rendered substitutional due to a misunderstanding of the finiteness requirements for semantics. With the limitation removed, we give an example of a substitutional interpretation of zf which is consistent if zf itself is.

Gottlieb, Dale. "the Truth about Arithmetic.", American Philosophical Quarterly. 1978; 15,81-90

First-order arithmetic is interpreted via substitutional quantification so that no ontological commitment to numbers is incurred, and all axioms are logically true. An account of certain kinds of applicability of arithmetic is suggested as the basis for understanding the atomic sentences of arithmetic.

Gottlieb, Dale. "A Method for Ontology, with Application to Numbers and Events.", Journal of Philosophy. 1976; 73,637-651

Substitutional quantification is defended as an ontologically neutral device for collecting sentences in referential languages. An attempt is made to interpret the quantifiers of first-order arithmetic and davidsonian action sentences substitutionally so as to avoid commitment to numbers and events. The criterion of ontological commitment is then reformulated in accordance with this method.

Hazen, A P. "Against Pluralism", Australasian Journal of Philosophy. 1993; 71(2), 132-144

It has been argued (by, e.g., George Boolos and David Lewis) that the interpretation of second-order variables as plural terms shows that at least monadic second-order logic is free of ontological commitment to classes. I refute this contention.

Hinckfuss, Ian. "Suppositions, Presuppositions, and Ontology", Canadian Journal of Philosophy. 1993; 23(4), 595-618

There is no inconsistency and a lot of common sense in taking the so-called truth conditions' and associated theories of formal semantics' to be false, though logically useful, presupposed conservative extensions of a more economical system. Hence there is no need to regard such semantics' as engendering an ontological commitment to sets, functions, or possible worlds. A similar approach would allow the withdrawal of physical properties, space, time and other non-material entities from our ontological commitments.

Hirsch, Eli. (Forthcoming). "Quantifier Variance and Realism".

HODES, Harold T. "Ontological Commitment: Thick and Thin IN Meaning and Method: Essays in Honor of Hilary" Putnam. Cambridge Univ Pr : New York, 1990

Discourse carries thin commitment to objects of a certain sort iff it says or implies that there are such objects. It carries a thick commitment to such objects iff an account of what determines truth values for its sentences say or implies that there are such objects. This paper presents two model theoretic semantics for mathematical discourse, one reflecting thick commitment to mathematical objects, the other reflecting only a thin commitment to them. According to the latter view, for example, the semantic role of number-words is not designation but rather the encoding of cardinality-quantifiers. I also present some reasons for preferring this view.

Hodes, Harold T. "Logicism And The Ontological Commitments of Arithmetic.", Journal of Philosophy. 1984; 81,123-149
The author contends that these notions of "intrinsicality" and of "standardness" are unintelligible. Accepting this theory is like thinking that algebraists who speak of "the countable atomless boolean algebra" are referring to a particular structure; instead the "standard" representor, and thus the cardinal numbers, are fictions introduced to encode a

fragment of third-order logic into first-order clothing. The third-order nature of arithmetic discourse is disguised partly by the success of this encoding, and partly by an ambiguity between local and global notions of logical form. The author elaborates on the distinctive nature of mathematical fictionality, and sketches the formal logic underlying the encoding. The author also sketches the way to handle two apparent difficulties: that of numbers applied to higher-type entities, and the possibility that there are finitely many actual objects.

Horgan, Terence. "Science Nominalized.", Philosophy of Science. 1984; 51,529-549

I propose a way of formulating scientific laws and magnitude attributions which eliminates ontological commitment to mathematical entities. I argue that science only requires quantitative sentences as thus formulated, and hence that we ought to deny the existence of sets and numbers. I argue that my approach cannot plausibly be extended to the concrete "theoretical" entities of science.

Hugly, Philip; Sayward, Charles. "Quantifying Over the Reals", Synthese. 1994; 101(1), 53-64

Peter Geach proposed a substitutional construal of quantification over thirty years ago. It is not standardly substitutional since it is not tied to those substitution instances currently available to us; rather, it is pegged to possible substitution instances. We argue that i) quantification over the real numbers can be construed substitutionally following Geach's idea; ii) a price to be paid, if it is that, is intuitionism; iii) quantification, thus conceived, does not in itself relieve us of ontological commitment to real numbers.

Jackson, Frank. "Ontological Commitment And Paraphrase.", Philosophy. 1980; 55,303-315

In this paper, I defend a modified referential theory of ontological commitment. I start by considering difficulties for quinean approaches over the role of paraphrase in eliminating ontological commitment.

Jubien, Michael. "Ontological Commitment to Kinds.", Synthese. 1975; 31,85-106

This paper presupposes and extends work done in "ontological commitment to particulars" ("synthese", volume 28, 1974). A semantical criterion of commitment to objects of a given kind is developed for the class of intensional interpreted theories introduced in the earlier paper. Next the question of the commitments of theories apparently treating pure abstract entities (especially mathematical theories) is taken up and a criterion is offered. Finally the criteria are modified so as to deal with theories apparently treating both pure and non-pure entities.

Jubien, Michael. "Ontological Commitment to Particulars.", Synthese. 1974; 28,513-531

An intensional notion of interpreted first-order theory is introduced and semantical criteria for commitment of such theories to particular concrete and (possibly) impure abstract entities are developed. Commitment "de dicto" and "de re" are distinguished and

numerous examples are discussed. The work is extended to "kinds" of entities and to theories treating pure abstract entities in a later paper in the same journal.

Jubien, Michael. "the Intensionality of Ontological Commitment", Nous. 1972; 6,378-387

Kaminsky, Jack. Church on Ontological Commitment. Journal of Philosophy. 1959; 56,452-457

Lavine, Shaughan. "Quantification and Ontology", Synthese. 2000; 124(1), 1-43

Quineans have taken the basic expression of ontological commitment to be an assertion of the form 'there is something that is a phi'. Here I take the existential quantifier to be introduced, not as an abbreviation for an expression of English, but via Tarskian semantics. I argue, contrary to the standard view, that Tarskian semantics, in fact, suggests a quite different picture: one in which quantification is of a substitutional type apparently first proposed by Geach. The ontological burden is borne by constant symbols and truth is defined separately from reference.

Mackie, Penelope. "Ordinary Language and Metaphysical Commitment", Analysis. 1993; 53(4), 243-251

In "Material Beings", Peter van Inwagen claims that although his own metaphysical theory-- according to which there are no chairs, rocks, or any other composite material objects except living organisms-- may appear to conflict with the ontological commitments of ordinary language, this appearance is illusory. The paper challenges this claim. It is argued that van Inwagen must hold that ordinary discourse is systematically misleading as to its ontological commitments, but that this radical thesis is not supported by the analogies (including an analogy with Copernican astronomy) to which he appeals in his attempt to reconcile his metaphysics with popular usage.

Martin, R M. Existential Quantification and the "Regimentation" of Ordinary Language. Mind. 1962; 71,525-529

Martin, R M. "on Church's Notion of Ontological Commitment." Philosophical Studies. 1960; 11,3-6

Melia, Joseph (1995) 'On What There Isn't.' *Analysis* 55: 223 - 9.

Parsons, Charles D. "Ontology And Mathematics.", Philosophical Review. 1971; 80,151-176

The paper discusses the ontological commitment of elementary and constructive theories in mathematics. In contrast to quine's position, in dealing with finitary arithmetic it is necessary to consider alternative conceptions of ontology from that based on classical quantificational logic. An account of the existence of numbers is developed which might be taken to claim the existence only of inscriptions, but it works only because it uses a different conception of existence, involving modality. For this reason it does not qualify as 'nominalist'. I argue that contrary to what is suggested by some writers, stronger

'abstract' conceptions in constructive mathematics require not a richer ontology (with intensional entities) but additional predicates, e.g. truth predicates. It is explained how to interpret predicative set theory in the same way.

Parsons, Terence. "Various Extensional Notions of Ontological Commitment.", Philosophical-Studies. 1970; 21,65-74

In this paper several different (and non-equivalent) characterizations of ontological commitment are extracted from the writings of w. v. quine, and some of their characteristics noted. Then each is evaluated with respect to its conformity to an intuitive notion of "what a theory says there is".

Parsons, Terence. "Extensional Theories of Ontological Commitment.", Journal of Philosophy. 1967; 64,446-450

The paper examines theories of ontological commitment which construe commitment to be an extensional relation between theories and objects. It is argued that any such theory which assigns the same commitments to logically equivalent theories, and which assigns at least as many commitments to a theory as to its logical consequences, will assign exactly the same commitments to all one-sentence theories whose sentences are of the form '(ex)ax', regardless of what atomic predicate 'a' is.

Quine, W V. On What There Is, Part Iii. Aristotelian Society. 1951; Suppl 25,149-160

Quine, W. V. "Ontology and Ideology", *Philosophical Studies* **2** (1951): 11-15.

Sayward, Charles. "What Is a Second Order Theory Committed To?", Erkenntnis. 1983; 20,79-92

Against views about ontological commitment urged by quine, I argue that "no" second order theory is ontologically committed to anything beyond what its "individual" variables range over.

Shapiro, Stewart. "Modality and Ontology", Mind. 1993; 102(407), 455-481

This paper concerns the relationship between ideology and ontology. The starting point is a series of recent programs whose strategy is to reduce ontology in mathematics by invoking some ideology, typically a modal operator. In each case, there are straightforward, often trivial, translations from the set-theoretic language of the realist to the proposed language with added ideology, and vice-versa. The contention is that, because of these translations, neither system can claim a major epistemological advantage over the other. The prima facie intractability of knowledge of abstract objects indicates an intractability concerning knowledge of the "new" notions. The prevailing criterion of ontological commitment, due to Quine, is that the ontology of a theory is the range of its bound variables; but recall that Quine insists on a fixed, and very austere ideology. It is

proposed here that, when this constraint is relaxed, the Quinean criterion is flawed, and an alternative, in structuralist terms, is developed.

Sider, Theodore. 2001. *Four-Dimensionalism: An Ontology of Persistence and Time*. (Oxford: Clarendon Press).

Sider, Theodore. 1999. "Presentism and Ontological Commitment", *The Journal of Philosophy* **96**: 325-347.

Simons, Peter. "Higher-Order Quantification and Ontological Commitment", Dialectica. 1997; 51(4), 255-271

George Boolos's employment of plurals to give an ontologically innocent interpretation of monadic higher-order quantification continues and extends a minority tradition in thinking about quantification and ontological commitment. An especially prominent member of that tradition is Stanislaw Lesniewski, and shall first draw attention to this work and its relation to that of Boolos. Secondly, I shall stand up briefly for plurals as logically respectable expressions, while noting their limitations in offering ontologically deflationary accounts of higher-order quantification. Thirdly, I shall focus on the key idea of ontological commitment and investigate its connection with the idea of truth-making. Fourthly, I shall consider how different interpretations of quantification may sideline Boolos's work, but finally I shall largely support his analysis of quantification involving nominal expressions, while arguing, in the spirit of Arthur Prior, that non-nominal quantification is noncommitting.

Simons, Peter M. "Ways", Kriterion. 1994; 4(7), 12-15

There is more than one way to kill a cat. What are ways? Very little has been written about them in general, but they appear at crucial places in many philosophical discussions. Clarity over the ontology of ways could help in several areas of philosophy. After indicating where ways have been mentioned. I discuss briefly the corresponding linguistic feature, adverbs of manner, before outlining three theories: a Platonistic one making ways a complex kind of function, a Davidsonian one in which ways are (mainly) properties of events, and finally the theory I prefer, a particularist one based on the concept of a higher-or-der trope. The latter is connected with the theory of truth-makers and avoids ontological commitment to corresponding general objects.

Simons, Peter. "Who's Afraid of Higher-Order Logic?", Grazer Philosophische Studien. 1993; 44, 253-264

Suppose you hold the following opinions in the philosophy of logic. First-order predicate logic is expressively inadequate to regiment concepts of mathematic and natural language; logicism is plausible and attractive; set theory as an adjunct to logic is unnatural and ontologically extravagant; humanly useable languages are finite in lexicon and syntax; it is worth striving for a Tarskian semantics for mathematics; there are no Platonic abstract objects. Then you are probably already in cognitive distress. One way to

decease your unhappiness, short for embracing Platonism, is to accept higher-order logic and look, as did Arthur Prior, for a plausible way to neutralize the ontological commitment to abstract entities that this acceptance appears to entail.

Stanley, Jason (forthcoming) 'Hermeneutic Fictionalism.' forthcoming in *Midwest Studies in Philosophy* **25**: Figurative Language, H. Wettstein, ed., Oxford, Blackwell Press.

van Inwagen, Peter. 1998. "Meta-Ontology", *Erkenntnis* **48**: 233-250.

van Inwagen, Peter. "Searle on Ontological Commitment in John Searle and His Critics, Lepore, Ernest (ed)", Blackwell : Cambridge, 1991

This article discusses Searle's criticism of Quine's "criterion of ontological commitment" in "Speech Acts". I argue that Searle has misunderstood Quine in several important respects, and that his arguments do not refute Quine's real theses on "ontological commitment."

Vision, Gerald. "Fiction and Fictionalist Reductions", Pacific Philosophical Quarterly. 1993; 74(2), 150-174

Apparently true sentences with fictional subjects, about possibilities in the fully analysed sentences of possible world semantics, or even sentences of mathematics cause theorists with robust intuitions ontological embarrassment. They appear to commit us to the existence of fictional characters, possibilia such as golden mountains, and numbers, respectively. It is tempting to propose prefixing a phrase such as in such- and- such a story' or in such- and- such a theory' to such sentences as a way both to eliminate the worrisome ontological commitment and to retain versimilitude. I argue that because this procedure changes so many vital implication relations the originals had when combined with other sentences which we would not want to prefix, the tactic is an utter failure.

Yablo, Steven (1998) 'Does Ontology Rest on a Mistake?' In *Proceedings of the Aristotelian Society*, supp. vol. 72: 229 - 61.

Mathematical entities

Benacerraf, Paul (1965) 'What Numbers Could Not Be.' *Philosophical Review* 74: 47 - 73.

Benacerraf, Paul (1973) 'Mathematical Truth.' *Journal of Philosophy* 70: 661 - 79.

Boolos, George (1985) 'Nominalist Platonism.' *Philosophical Review* 94; 327 - 44.

Burgess, John and Gideon Rosen (1997) *A Subject with no Object.* Oxford: Clarendon Press.

Field, Hartry. 1993. "The Conceptual Contingency of Mathematical Objects", *Mind* **102**: 285-299.

Field, Hartry. 1989. *Realism, Mathematics and Modality*. (Oxford: Basil Blackwell).

Field, Hartry. 1985. "On Conservativeness and Incompleteness", *Journal of Philosophy* **81**: 239-260. Reprinted in Field 1989.

Field, Hartry. 1984. "Critical Notice of Crispin Wright: *Frege's Conception of Numbers as Objects*", *Canadian Journal of Philosophy* **14**: 637-662. Reprinted as "Platonism for Cheap? Crispin Wright on Frege's Context Principle" in Field 1989.

Field, Hartry. 1980. *Science Without Numbers*. (Princeton: Princeton University Press).

Gendler Szabó, Zoltan. (Forthcoming). "Nominalism", in Michael Loux and Dean Zimmerman, eds., *Oxford Handbook of Metaphysics* (Oxford: Oxford University Press).

Hale, Bob (1987) *Abstract Objects.* Oxford: Blackwell.

Hellman, Geoffrey (1989) *Mathematics Without Numbers.* Oxford: Clarendon Press.

Hodes, Harold (1984) 'Logicism and the Ontological Commitments of Arithmetic.' *Journal of Philosophy* **81**: 123 - 49.

Jubien, Michael (1977) 'Ontology and Mathematical Truth.' *Nous* 11: 133 - 50.

Lowe, E. J. (1995) 'The Metaphysics of Abstract Objects.' *Journal of Philosophy* 92: 509 - 24.

Malament, David (1982) 'Review of Hartry Field's *Science Without Numbers.' Journal of Philosophy* 79: 523 - 34.

Putnam, Hilary (1967) 'Mathematics Without Foundations.' *Journal of Philosophy* 64: 5 -22.

Putnam, Hilary (1971) *Philosophy of Logic.* New York: Harper.
Rosen, Gideon (1993) 'The Refutation of Nominalism(?)' *Philosophical Topics* 21: 149 - 86.

Shapiro, Stewart (1983) 'Conservativeness and Incompleteness.' *Journal of Philosophy* 80: 521 - 31.

Wright, Crispin and Bob Hale. 1992. "Nominalism and the Contingency of Abstract Objects", *Journal of Philosophy* **89**: 111-135.

Yablo, Steven (forthcoming) 'A Paradox of Existence.' www.mit.edu/~yablo/apex.html.