Two Physicalist Arguments for Microphysical Manyism

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Pre-publication draft. Forthcoming in *Erkenntnis*.

Abstract: I here defend microphysical manyism. According to microphysical manyism, each composite or higher-level object is a mere plurality of microphysical particles. After clarifying the commitments of the view, I offer two physicalist-friendly arguments in its favour. The first argument appeals to the Canberra Plan. Here I argue that microphysical particles acting in unison play the theoretical roles associated with composite objects - that they do everything that we think of composite objects as doing - and thus that composite objects are to be identified with pluralities of microphysical particles. Along the way I rebut the objections that pluralities of particles don't display the right emergent, 'lingering', or modal properties to be good candidates for identification with higher-level objects. In the second argument I claim that microphysical manyism is uniquely able to capture a compelling and widespread physicalist intuition concerning the intimate nature of the relationship between higher-level, composite objects and the microphysical world.

Keywords: manyism; plurality; composite objects; Canberra Plan; Ramsey-Lewis Treatment of Theoretical Terms; physicalism; reductionism

1 – Microphysical Manyism

Manyism, introduced in my (2023), is a view about the nature of composite objects. In brief, it is the view that each composite object is identical to a plurality of microphysical particles, where 'plurality' is stipulated to be a plural term that refers plurally to some things, rather than to some set-like collection of those things. More exactly, manyism can be clarified as the conjunction of three claims.[1] First, manyism affirms the existence of composite objects *qua* pluralities:

> EXISTENCE: $\exists xx$ (*xx* are jointly a composite object)

Thus manyism is not mereological nihilism, the view that composite objects do not exist.[2]

Second, manyism should be taken to imply that each composite object is identical to a *proper* plurality of microphysical particles, as opposed to a degenerate, improper plurality (i.e. a plurality of one, i.e. an individual):

> PROPER PLURALITY: $\forall xx$ (if *xx* are jointly a composite object then $\exists yy$ [*yy* has at least two distinct members and $xx = yy$])

Manyism's commitment to PROPER PLURALITY distinguishes it from orthodox views that take

[1] As is standard, I'll take plural variables (e.g. *xx*) to be capable of taking as values either (proper) pluralities or individuals; a singular variable (e.g. *x*) can in contrast only take as a value an individual.

[2] It may be protested that sophisticated versions of nihilism include semantic accounts that allow them to accept the existence of composite objects *qua* pluralities of particles (cf. Liggins 2008, Contessa 2014). But sophisticated nihilists cannot consistently maintain that composite objects exist when 'exist' is taken to express the most fundamental, perfectly joint-carving quantifier. Manyism may be distinguished from all forms of nihilism, then, by the observation that the existential quantifier in EXISTENCE is stipulated to be the most fundamental, perfectly joint-carving one (for further discussion see Thunder 2023: §3.3.3).

composite objects to be identical not to proper pluralities but rather to individuals made up of proper pluralities.

Third, the proper pluralities to which manyism claims composite objects to be identical are not also improper pluralities:

> EXCLUSIVELY PROPER: $\forall xx$ (if xx are jointly a composite object then $\neg\exists y\ y = xx$)

Thus manyism is not Composition as Identity (CAI), the view that composite objects are individuals that are also proper pluralities of their parts.[3]

The foregoing claims characterise manyism.[4] *Microphysical* manyism additionally explicitly accepts:

> MICROPHYSICAL PLURALITIES: $\forall xx$ (if xx are jointly a composite object then $\forall y$ [if y is a member of xx then y is a microphysical particle])

Thus microphysical manyism takes the pluralities to which composite objects are identical to be made up of microphysical particles.

Like most metaphysical views, microphysical manyism faces various challenges, not least: how can the view account for what is apparently plural quantification over composite objects, given that it claims composite objects to themselves be pluralities?; Is microphysical manyism objectionably inconsistent with the possibility of so-called atomless gunk, i.e. composite objects all of whose parts are composite?; Is manyism not just incoherent, for example on the grounds that objects are by definition individuals, or at least that objects that are the result of *composition* are by definition individuals? These are important questions, and I address them in some detail in my (2023). Here, I simply refer the reader to the answers I gave there, and provide only a brief recap in a footnote.[5] In what follows, I assume that microphysical manyism is coherent and defensible from immediate objections, and take up the project of providing positive reason to accept the view.

In particular, I'll here argue that *physicalists* have good reason to accept microphysical manyism. I'll do so by offering two arguments for microphysical manyism that should appeal particularly to the physicalistically inclined. The first utilises the Canberra Plan, a methodology often employed by physicalists. Here I argue that microphysical particles acting in unison play composite-object-roles – that they do everything that we think of composite objects as doing – and thus that composite objects are to be identified with pluralities of microphysical particles. The second (§3) appeals to an intuition,

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[3] Or at least, manyism is different from *standard* forms of CAI. See Thunder (2023: 22).

[4] Since it isn't relevant here, I'm bracketing the additional stipulation from my (2023) that the individual members of the proper plurality to which a given composite object is identical are the parts of that composite object. That stipulation would be captured by:

> PARTS: $\forall xx$ (if xx are jointly a composite object then $\forall y$ [y is one of xx iff y is a part of xx])

[5] The answers are: the manyist takes apparently plural quantification over composite objects to be *super*plural quantification, i.e. quantification over pluralities of pluralities of individuals that ontologically commits us to nothing more than the base individuals, and insists that such quantification is intelligible (Thunder 2023: 40-1); manyists can reasonably either suggest that the possibility of gunk is an illusion or else accommodate the possibility by claiming manyism to be only contingently true (42-3); manyists regard any attempt to show their view to be ruled out by the meanings of terms such as 'object' or 'composition' to be implausible, question-begging, or both (24-7).

endorsed by several physicalists, concerning the intimate nature of the relationship between higher-level, composite objects and the microphysical world. I argue that microphysical manyism is uniquely able to capture this intuition.

2 – The Argument from the Canberra Plan

The Canberra Plan ('the Plan') is typically deployed in defence of physicalism, as a way to show that putatively non-physical phenomena of one sort or another (mental states, moral properties, etc.) are really physical after all, in virtue of being identical to some things already present in a physicalist ontology (e.g. Lewis 1972, Jackson 2000). The strategy for doing so is to claim that the putatively non-physical phenomena in question are exhaustively characterised by the theoretical role they play, and that physical things in fact play (or occupy) the relevant roles. I'm going to deploy the Plan in order to show that composite objects are really identical to pluralities of particles that are already present in a *micro*physicalist ontology, since pluralities of microphyical particles occupy the roles characteristic of composite objects.

This argument faces an immediate roadblock: it turns out that the Plan in its canonical formulation is inconsistent with the possibility that objects of interest might turn out to be identical to proper pluralities of things. I begin, then, by demonstrating that this is a fixable deficiency in the canonical formulation of the Plan, not with my argument.

2.1 – The Canberra Plan, Pluralised

The deficiency is to be found in a central component of the Plan, namely the Ramsey-Lewis treatment of theoretical terms ('the Treatment'). The Treatment is an account of how theoretical terms, i.e. terms introduced without explicit definition by a new theory, come to have meaning. It was developed and popularised by Lewis (esp. 1970, 1972: 250-5). According to it, theoretical terms ('T-terms') are implicitly given definitions by the theory that introduces them, in that the theory in question specifies some roles and implies that the T-terms are to name the occupants of those roles. By finding out what the occupants of those roles are, we can find out what, if anything, a given T-term refers to, and thus to what the referent of that T-term is identical.

The problem with the Treatment is that its canonical formulation (found in Lewis [1972: 253-5] illicitly rules out the possibility that a given theoretical role might be occupied by a proper pluralitiy of things acting in unison, and thus that a given T-term might turn out to be a plural name for that proper plurality of things. This can be appreciated by considering the first couple of steps of the Lewisian formulation.

Let T be a given theory, and let [t_1, ... t_n] be the n T-terms that that theory introduces. Step one of the treatment is to convert T into a single long conjunctive sentence, called the postulate of T, written like this:

(1) T[t_1, ... t_n]

The postulate says of the entities named by the T-terms it uses that they have certain properties, do certain things, and stand in certain relations to each other and to entities named by terms that we already understand the meaning of. That is, it says of the referents of [t_1, ... t_n] that they occupy certain

corresponding roles [R_1, ... R_n].

The second step is to replace each T-term of this postulate with a free variable, to get the realisation formula of T. Lewis writes the realisation formula like this:

(2) T[x_1, ... x_n]

But (2) smuggles in an illicit assumption. By using *singular* free variables, x_1, ... x_n the value of each of which can by definition only be a single entity, Lewis's (2) assumes that the reference of each t_i is a single entity, i.e. that each t_i is singularly referring. Nothing warrants this assumption. At this stage, all we know is that our theory T has specified some roles, [R_1, ... R_n], and has implied that each R_i is occupied by what the corresponding t_i refers to. But there's no reason for thinking that roles can't in principle be occupied by many entities collectively, as might happen when several police officers jointly play the role of *surrounding the building*, or when several particles jointly play the role of *inducing the nuclear reaction*.[6] Furthermore, plural reference, whereby a single referring expression refers to many entities at once, is widely agreed to be possible (e.g. Oliver and Smiley 2016: esp. chs 3-4). It follows that there's no reason, semantic or metaphysical, to exclude at this stage the possibility that some or all of [t_1, ... t_n] plurally refer to many entities that jointly occupy the relevant role.

The fix is simple: we should use *plural* variables to represent the referents of [t_1, ... t_n]. The value of a plural variable can be either a single entity or many entities, so by using plural variables we remain appropriately neutral as to whether [t_1, ... t_n] are plurally referring or not, and whether the roles associated with [t_1, ... t_n] are occupied by single entities or by many entities collectively. Thus we should replace Lewis's (2) with the *plural* realisation formula:

(2*) T[xx_1, … xx_n]

In his original formulation, Lewis goes on to show that if there is an n-tuple that uniquely realises T's realisation formula (that is, if there is an n-tuple uniquely such that its members occupy the roles associated by T with x_1, …, x_n), then T's T-terms refer to the corresponding members of that n-tuple (and fail to refer otherwise).[7] Given the foregoing discussion, we should clarify that it is possible to discover that a given member of the uniquely realising n-tuple is a proper plurality of things, in which case we should conclude that the relevant T-term refers plurally to those things.[8]

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[6] Of course, these examples present no difficulty for Lewis's formulation of the Treatment if the referents of expressions like 'several police officers' or 'the particles' are each singular things such as groups or sets. But we should not build in to our formulation of the Treatment or the Plan the singularist assumption that the correct treatment of pluralities is as set-like individuals. Given that the Plan is often used to help decide metaphysical disputes (case in point, the present paper), it should be as neutral as possible on matters of metaphysics. I take this claim to be a instance of Fine's cogent point that key notions or tools of metaphysics should be formulated in such a way as not to 'settle, as a matter of definition, any issue which we are inclined to regard as a matter of substance' (1994: 5). It is a matter of substance whether pluralities are genuinely plural or really just single set-like things, so the formulation of the Treatment should be consistent with the view that pluralities are genuinely plural.

[7] Lewis later altered his account to allow that in some cases of multiple realisation of a theory, that theory's T-terms still refer (1997: 334). I'll return to this briefly in §2.2.

[8] Note that no part of my reasoning here has relied on the assumption of any form of manyism. *Everyone* has reason to think that the Canberra Plan should be modified in the way I suggest. For example, suppose that a detective's theory claims that some crimes were committed by 'the Manchester muggers', where 'the Manchester Muggers' is intended as a name for some particular criminals (rather than as a definition description for anyone who mugs people in Manchester) who are believed to be behind several other robberies. When we

Call the result of swapping singular variables in Lewis's canonical formulation of the Treatment with plural ones the 'Pluralised Treatment'. By appealing to the Pluralised Treatment rather than the canonical one, we open up the possibility of using the Canberra Plan to discover that a certain phenomenon or object of interest is in fact identical to a proper plurality of things that we already have in our ontology. So I'm now in a position to use it to argue that composite objects are identical to proper pluralities of microphysical particles already in the microphysicalist's ontology.

2.2 – Deploying the Plan

To deploy the Canberra Plan in defence of microphysical manyism, we need to do three things:

(i) Assume that all there are are microphysical particles.[9]
(ii) Determine what theory implicitly defines terms for composite objects by associating them with theoretical roles.
(iii) Show that the relevant theoretical roles are uniquely occupied by pluralities of microphysical particles.

In line with (i), I assume an ontology consisting only of microphysical particles. It's worth noting that, given this assumption, the support that the Canberra Plan lends to microphysical manyism will at best be conditional: *if* all there are are microphysical particles, then each composite object is identical to some plurality of those particles. So it goes with the Canberra Plan (cf. Braddon-Mitchell and Nola 2008: 8-9). But if this conditional claim can be established then it's not such a large step to the unconditional Ockhamite one that since we don't need to posit anything more than microphysical particles to secure the existence of composite objects, we shouldn't.

For help with (ii), it is standard to utilise another of Lewis's insights, which is that theories need not always be scientific: there can be folk theories too (Lewis 1972: 253-6). A folk theory of X is the disjunction of conjunctions of most of the claims concerning X that the folk invariably take to be true. Plausibly, when we're concerned with what a certain term of ordinary language means, it makes sense to find out how that term features in the ordinary, folk theory of the relevant phenomenon and to say that the term is defined as naming whatever uniquely occupies the role associated with it by that folk

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subject the detective's theory to the Plan, we should want it to be possible (and perhaps even mandatory) that what uniquely occupies the Manchester-Muggers-role – and thus what the referent of 'the Manchester Muggers' is – is a plurality of people. But on Lewis's formulation of the Treatment, this would be impossible unless we assume that pluralities are really set-like individuals, an assumption that we shouldn't build into the Plan (see note 6). Thanks to a reviewer for pressing me on this point.

[9] Strictly speaking, this assumption is stronger than what is required. To be consistent with certain views in quantum mechanics according to which the particles of the Standard Model are not fundamental but rather derivative of more fundamental quantum goings-on, my argument could make do with the weaker assumption that all that there are are microphysical particles *and, perhaps, goings-on more fundamental than microphysical particles*. My argument would then proceed as it does in main text, by showing that pluralities of particles – whether they be fundamental or derivative – uniquely occupy composite-object-roles and so should be identified with composite objects. Note that my argument would still go through even if it turned out that all microphysical-particle-roles were uniquely occupied by some more fundamental quantum 'going-on': given the Canberra Plan, that would simply be a circumstance in which each microphysical particle is identical to the relevant quantum 'going-on', which would not at all preclude pluralities of microphysical particles, so identified, from uniquely occupying composite-object-roles. All of that said, however, my argument does assume that there are microphysical particles, and is as such hostage to whether best physics will ultimately retain or dispense with particles. Thanks to a reviewer for helpful discussion here.

theory (Jackson 2000: 30-8). In our case, since terms for composite objects include both ordinary terms (such as 'table') and scientific ones (such as 'hydrogen atom'), it makes sense to take the relevant theory of composite objects to be some appropriate combination of folk and scientific theorising.

What remains, in line with (iii), is to argue that if all there are are microphysical particles then pluralities of such particles uniquely occupy the roles associated by the folk-scientific theory with terms for composite objects.

The uniqueness claim here seems relatively uncontroversial. If all there are are microphysical particles, then what else other than pluralities of those particles could occupy the roles? The only possible doubt here seems to be the thought that, for any plurality that occupies a given composite-object role, there'll be several other pluralities that differ in membership from the original very slightly, perhaps by one or two particles, and that also occupy the role. But even if this is right, it need not concern us. Following Lewis (1997: 334), it's plausible that in such cases we can infer that the relevant T-term is semantically indeterminate between the candidate realisers, and that at least on every *precisification* of the T-term in question, the role associated with it is uniquely occupied by some plurality of particles. That claim suffices for my purposes. Even if there are multiple Mount-Everest-roles corresponding to multiple precisifications of 'Mount Everest', for example, as long as each is uniquely occupied by a certain plurality of particles, we can still conclude that Mount Everest is identical to a plurality of microphysical particles (we just need the caveat that it is indeterminate exactly to which).

The claim that pluralities of microphysical particles occupy composite-object roles in the first place may be more controversial. To defend it, it will first be helpful to borrow a piece of terminology from the debate about composition: for each composite *F*, the plurality of particles that I claim occupy the *F*-role are *arranged F-wise* (e.g. van Inwagen 1990: 109). Intuitively, some particles are arranged *F*-wise iff they are the particles that compose an *F* (or that would compose an *F* if they composed anything).

A flat-footed argument in favour of the thought that each composite-*F* role is occupied by a corresponding plurality of microphysical particles arranged *F*-wise, then, is simply that pluralities of particles arranged *F*-wise and composite *F*s are plausibly completely empirically indistinguishable. If you knew that you had in front of you either a composite *F* or a mere plurality of particles arranged *F*-wise, no observation you could make or test you could run could allow you to tell which you had. This claim finds widespread support in the literature (e.g. Rosen and Dorr 2002: 155, §7, Sider 2013: §5, LeBrun 2021), and especially in Merricks (2001: ch. 3), who, as part of a wider argument from overdetermination for eliminativism about non-conscious composite *F*s, argues that at least any causal work – and therefore any empirically detectable activity – performed by non-conscious composite *F*s is also performed by pluralities of particles arranged *F*-wise (admittedly Merricks doesn't think that this argument works for conscious composite *F*s. We'll come to this momentarily). Even those who resist Merricks's argument typically grant his overdetermination claim, denying instead that such overdetermination is objectionable (Sider 2003, Thomasson 2007: ch. 1, Korman 2015: ch. 10, Papineau 2008: 143n10). At least when it comes to empirically detectable activity, pluralities of particles simply seem to do everything that we think of composite objects as doing. That makes it plausible to think that pluralities of particles arranged *F*-wise occupy composite-*F* roles.

To resist this conclusion, some feature or characteristic of what it is to be some composite *F* must be

identified that corresponding pluralities of particles arranged *F*-wise do not plausibly instantiate. I'll now consider three attempts to identify such a characteristic and argue that none succeed.

2.2.1 – Emergent Properties

First, one might think that occupation of composite-*F*-roles in some cases requires the instantiation of emergent properties, and that pluralities of particles arranged *F*-wise cannot instantiate such properties. Merricks, for example, would say as much: he thinks that *conscious* composite beings instantiate emergent mental properties and powers that are not instantiated by particles arranged conscious-being-wise (2001: ch. 4). So would Schaffer, who thinks that entangled systems of subatomic particles instantiate an anti-correlative property (e.g. a property that determines that the system's constituent particles must have opposite spins) that is emergent in the sense of not being fixed or determined by the properties of the individual particles, and therefore that cannot be instantiated by the particles themselves (2010: 51-2).

But why think that pluralities of particles arranged *F*-wise cannot jointly instantiate emergent properties of this sort? Merricks and Schaffer insist that the emergent properties they discuss fail to supervene on or reduce to properties of individual particles, but if we simply allow that properties instantiated collectively by a given plurality sometimes similarly fail to supervene on or reduce to properties of the individual particles in the plurality (and there is, as far as I can see, no reason why *we can't* allow this), then we can maintain that pluralities can instantiate emergent properties of the required sort (cf. Caves 2018, Cornell 2017). One might doubt, as van Inwagen (1990: 117-9) does, whether it is conceptually coherent to think that mental properties in particular can be collectively instantiated, but (i) I simply don't see any incoherence to the idea, (ii) I'm not aware of any attempts to defend the incoherence claim (van Inwagen himself concedes that he has 'no knock-down response' to dissenters), and (iii) at least some other philosophers explicitly accept that pluralities of particles can jointly instantiate mental properties.[10] Or one might object, as Schaffer (2010: 54) does (drawing on Healey [1991: 420]), to treating anti-correlative properties as collectively instantiated properties of pluralities of particles – or as Schaffer puts it, treating them as 'entanglement relations' – on the grounds that it prevents us from attributing the same collective anti-correlative property / entanglement relation to different systems with different numbers of components, since relations with different adicities are distinct. But as Brenner (2018: 667) points out, if the entanglement relation is treated as multigrade then the difficulty evaporates, since multigrade relations can by definition be had by variable numbers of things. So I don't see any good reason to doubt that pluralities of particles can instantiate emergent properties necessary for occupying composite-*F* roles.

2.2.2 – Lingering Properties

The second objection concerns what I'll call *lingering* properties. Lingering properties are properties that take time to instantiate.[11] The objection is that in many cases no plurality of particles arranged *F*-wise remains so arranged for long enough to instantiate the lingering properties our folk-scientific theory takes to be non-negotiable features of what it is to be a composite *F* (cf. Long 2019: 465-6). For example, though the discussion above may show that a given plurality of particles can in principle

[10] E.g. Bohn (2019: §4), Caves (2018: §2), Cornell (2017: §4), and Rosen and Dorr (2002: §6).
[11] Cf. Hawley (2001: 47ff) on corresponding 'lingering predicates'.

jointly instantiate the mental properties necessary for conscious thought, you might still worry that thinking takes time, and that in practice, given the nature of quantum reality, no plurality of particles remains arranged brain-wise for long enough to actually engage in any thinking. Rather, the best that we can say is that the thinking gets done (as it were) by the cooperative activities of a succession of distinct pluralities of particles, none of which can be said to think on its own. Since our folk-scientific theory has it that (live, healthy) brains think, one might be tempted to conclude that pluralities of particles arranged brain-wise are incapable of occupying brain-roles.

But this problem, too, can be overcome. The solution co-opts resources from the stage theory of persistence, according to which continuants such as brains are identical to instantaneous stages that pop in and out of existence from one moment to the next. Stage theorists face the objection that no single instantaneous brain-stage persists for long enough to do any thinking, but reply by offering an account of what it is to think according to which a given brain-stage can rightly be said to think if it is one in a series of brain-stages that are related to one another in the right way – i.e., in Sider (2001)'s terminology, that are related to one another by the appropriate *temporal counterpart relation* – that jointly 'get the thinking done' (see Sider 2001: 197-8, Hawley 2001: 53-7). We can say something very similar in defence of the claim that a plurality of particles arranged brain-wise can think. Suppose the relevant particles arranged brain-wise exist at t. Call them the bs. Unlike in the stage theory case, the issue isn't that the bs completely cease to exist once time ticks over from t to t^*: rather it is that at t^* the bs are no longer arranged brain-wise. What is true, though, is that at t^* a numerically distinct plurality of particles, call them the b^*s, are now arranged brain-wise; then at t^{**} the b^{**}s are the ones arranged brain-wise; and so on. Further, just as Sider would say that the brain-stage at t bears the temporal counterpart relation to a certain brain-stage at t^*, which in turn bears the temporal counterpart relation to a certain brain-stage at t^{**}, and so on, so we can say that the bs collectively bear a certain relation – call it the plural temporal counterpart relation – to the b^*s, which in turn collectively bear that relation to the b^{**}s, and so on; just as Sider would say that the action of thinking can be correctly attributed to the brain-stage at t in virtue of that stage being one of many brain-stages that are related via the temporal counterpart relation and that together get the thinking done, so we can say that the action of thinking can be correctly attributed to the bs in virtue of their being one of many pluralities of particles arranged brain-wise that are related to one another via the plural temporal counterpart relation and that together get the thinking done. In general, if the microphysical manyist offers this kind of stage-theoretic analysis of lingering properties, she can maintain that pluralities of particles instantiate any and all lingering properties necessary for occupying composite-object roles.[12]

2.2.3 – Modal Flexibility

The third objection can be responded to using similar resources. The objection is that folk and scientific theorising has it that composite objects could have been made up of different particles to the ones that actually make them up, but that the nature of pluralities is such that no plurality of particles could have been made up of different particles in this way (cf. Florio and Linnebo 2021: ch. 10). If this is right, then pluralities of particles are not *modally flexible* enough to occupy composite-*F* roles.

[12] An alternative approach that I lack the space to explore fully here would be to take inspiration not from the stage theory but rather from perdurantism, and to identify composite objects with four-dimensional, temporally extended pluralities of particles (that is, to follow the perdurantist in identifying composite objects with so-called 'spacetime worms', but to insist that each spacetime worm is a mere proper plurality of its microphysical parts). Such a view also seems well-placed to avoid the 'lingering property' objection.

But again, in response, we can appeal to a plural counterpart relation, this time a modal one rather than a temporal one. Just as counterpart theorists (most notably Lewis [1968, 1971, 1986: §4.5]) analyse *de re* modal predications of an object in terms of the attributes of otherworldly objects to which the actual object bears the salient counterpart relation, so we can analyse a *de re* modal predication of a plurality of particles in terms of the attributes of otherworldly pluralities to which the actual particles jointly bear the salient *plural* counterpart relation. Just like ordinary modal counterpart relations, plural counterpart relations are relations of similarity, with context determining which aspect of similarity – and thus which plural counterpart relation – is relevant in any given instance of modal predication. Moreover, although one way in which two pluralities can be similar to one another is to be *same-membered*, there are plenty of ways in which pluralities can be similar to one another despite different in membership (examples include *being arranged into the same shape*, *performing the same collective function*, *charting the same spatiotemporal path*, etc.). Plausibly, then, an actual plurality can bear plural counterpart relations to differently-membered otherworldly pluralities. If we analyse *de re* modal claims in terms of such plural counterpart relations, it will be true that composite objects *qua* pluralities of particles could have been made up of different particles to the ones of which they are actually made.

To illustrate, consider a human person that is, by hypothesis, a plurality of particles, *hh*. In the context of considering *hh* as a human person, the salient plural counterpart relation is plausibly the *personal* plural counterpart relation, i.e. the one that *hh* bears to otherworldly pluralities that share enough of *hh*'s personal traits (its quickness to anger, its belief in UFOs, ...) (cf. Lewis 1971). Since *hh*'s personal traits surely do not essentially depend on the identities of the particles that make up *hh*, these otherworldly pluralities will include pluralities made up of different members to the ones that make up *hh*. Thus, given the counterpart-theoretic semantics, it will be true in this context that *hh* could have been made up of different particles to the ones that actually make it up.

Suppose instead that we're in a context in which we are considering *hh* as a human *body* rather than a human person. Now the salient plural counterpart relation is the *bodily* plural counterpart relation, i.e. the one that *hh* bears to otherworldly pluralities that share enough of *hh*'s bodily characteristics. Again, these pluralities will surely include pluralities with different members to *hh*, so again it will be true that *hh* could have been made up of different particles to the ones that actually make it up.

Granted, there does seem to be a context in which it will come out false on the proposed analysis that a given composite object *qua* pluralities of particles could have been made up of different particles to the ones that actually make it up. Suppose that we are in a context in which we are considering *hh* as a *mere aggregate of particles*, or as a *mereologically rigid fusion*. Plausibly, *hh's* mere-aggregate/mereologically-rigid-fusion plural counterparts will all be made up of the same particles as *hh*. But I take it that in this context it is no longer counterintuitive that *hh* couldn't have been made up of different particles: if we get ourselves into the mindset of thinking of *hh* as (e.g.) a mere aggregate of particles, then given that our intuitions are that aggregates have their members essentially, it seems perfectly intuitive to say that *hh* could not have been made up of different members. It is only in the context of thinking of *hh* as a mereologically non-rigid composite object (e.g. as a person, or as a human body) that we must say that *hh* could have been made up of different particles, and in such contexts we are able to do so.[13]

[13] This proposed counterpart-theoretic semantics for *de re* modal claims about pluralities of particles is consistent with the idea that microphysical particles are not worldbound. In particular, even if a certain plurality of actually existing particles, *aa*, also exist at other worlds, nothing forces us to say that what *de re* modal

It seems, then, that the microphysical manyist has the resources to agree in the appropriate circumstances that pluralities of particles arranged *F*-wise could have been made up of different particles and are as such modally flexible enough to occupy composite-object-roles after all.[14] [15]

2.2.4 – Conclusion

Putting all of this together: pluralities of particles arranged *F*-wise seem completely empirically indistinguishable from corresponding composite *F*s, and they are plausibly capable of instantiating all of the emergent, lingering, and modal properties necessary for occupying composite-*F* roles. I conclude that such pluralities occupy composite-roles. Further, on the assumption that all there are are microphysical particles, they do so uniquely. Given the methodology of the Canberra Plan, that provides strong support for microphysical manyism's claim that each composite object is identical to a plurality of microphysical particles.

3 – The Argument from a Microreductive Intuition

My second physicalist-friendly argument for microphysical manyism does not rely on the methodology of the Canberra Plan. Instead, it appeals to a powerful and relatively widespread intuition – one that is likely to be especially compelling to physicalists – concerning the nature of the relationship between so-called higher-level objects and the microphysical world. Higher-level objects are objects treated in the special sciences and recognised by common sense, including tables, molecules, planets, organisms, mountains, etc. An orthodox view about higher-level objects is that they are composite objects composed of microphysical particles (e.g. Oppenheim and Putnam 1958: 9; Kim 1998: 15). Microphysical manyism further claims that higher-level objects are therefore mere pluralities of microphysical particles. My argument is that in saying this, microphysical manyism turns out to be the only way of capturing what I'll call the *Microreductive Intuition* (hereafter 'MRI')

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predications are actually true of *aa* are automatically determined by the properties that *aa* has at other worlds: we can simply maintain that the actual truth values of *de re* modal claims concerning *aa* are determined solely by the properties of pluralities to which *aa* bears the contextually salient counterpart relation, irrespective of whether any of these pluralities are identical to *aa*. Facts about what *aa* is transworld identical are, on this picture, entirely irrelevant to determining what is *de re* modally true of *aa*, with the possible exception of a case in which context selects a counterpart relation that *aa* bear to all and only pluralities to which *aa* are transworld identical. (See Varzi [2020] for further discussion and defence of the viability of marrying counterpart theory with non-worldbound individuals). Thanks to a reviewer for discussion, and for helpfully pointing out two interesting alternative conceptions of how transworld identity and counterpart relations might interact here, namely: that the counterpart relation that coincides with the relation of transworld identity is metaphysically privileged, in the sense that it is the one relevant to *de re* modal claims about *aa* made in a fundamental, perfectly joint-carving language; that both a counterpart-theoretic treatment and a transworld-identity-based treatment provide legitimate understandings of *de re* modal claims about *aa*.

[14] Some maintain that counterpart-theoretic semantics of the sort appealed to in this section are objectionable (e.g. Fara and Williamson 2005, Torza 2012). But insofar as those semantics remain a live option the debate about *de re* modality (see e.g. Hall, Rabern, and Schwarz [2021] for an overview of ways to defend them), it seems dialectically appropriate for the microphysical manyist to appeal to them. I note also that counterpart-theoretic semantics have been shown plausibly to be compatible with actualism, and as such carry with them no objectionable commitment to modal realism (e.g. Lewis 1986: 237, Wang 2015, and Varzi 2020: §3).

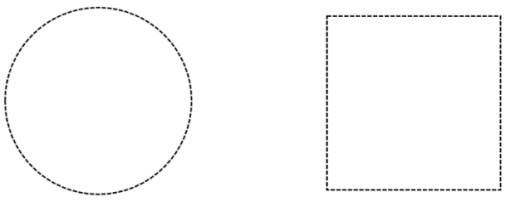
[15] My appeal to plural- and modal-counterpart-theoretic semantics in this and the previous section has precedent in Wilhelm (2022: §3.2), who deploys such semantics in defence of his theory of groups *qua* pluralities.

3.1 – The Microreductive Intuition

MRI says that higher-level objects reduce to microphysical particles in a certain sense. That sense can be illustrated by two cases, the first of which is due to Lewis:

> 'Imagine a grid of a million tiny spots – pixels – each of which can be made light or dark. When some are light and some are dark, they form a picture, replete with interesting intrinsic gestalt properties. The case evokes reductionist comments. Yes, the picture really does exist. Yes, it really does have those gestalt properties. However the picture and the properties reduce to the arrangement of light and dark pixels. They are nothing over and above the pixels. They make nothing true that is not made true already by the pixels. They could go unmentioned in an inventory of what there is without thereby rendering that inventory incomplete. And so on.' (Lewis 1994: 413)

The second case, due to Pettit (1994: 254-6; 1995), is very similar. Pettit asks us to consider a two-dimensional world in which there are some dots that are arranged in such a way as to 'make up' some shapes, and in which there are additionally no continuous lines around to interfere in the manner in which the shapes appear to arise out of the arrangement of dots:



He then contends that in the 'dottist' world he describes, the shapes are 'perfectly real' (1995: 144) but reduce to the dots, in the sense that 'given the dots and only the dots, the shapes come for free' (143), and that shape-level facts are 'nothing over and above' dot-level facts (142).

MRI is the intuition – encouraged by Lewis and Pettit – that higher-level objects are to microphysical goings-on what Lewis and Pettit's picture and shapes are to the pixel- and dot-level goings-on respectively. Let 'reduction$_{LP}$' refer to the specific sense in which Lewis and Pettit think that the picture/shapes reduce to the pixel-/dot-level goings-on. Thus:

> MRI: Higher-level objects reduce$_{LP}$ to microphysical goings-on.

According to MRI, then, higher-level objects are nothing over and above microphysical goings-on, in the sense that higher-level objects are somehow *already accounted for* in the microphysical goings-on, that higher-level objects exist but can go unmentioned in a complete inventory of what there is (as Lewis would put it), that the existence of higher-level objects is consistent with the claim that 'the empirical world contains just what a true complete [micro-]physics would say it contains' (as Pettit puts it [1993: 213]), etc.[16]

[16] Note that MRI does not capture everything that Lewis and Pettit want to say about the relationship between higher-level goings-on and microphysical ones, because it does not also say that higher-level goings-on such as *properties* or *facts* reduce$_{LP}$ to the microphysical. It is nevertheless a trivial consequence of Lewis and Pettit's broader microreductionism$_{LP}$.

So understood, MRI seems to me to be just the sort of thing that physicalists should want to say about higher-level objects. At any rate, as a physicalist, it seems to me to be both immediately compelling to think that Pettit's shapes are in the requisite sense nothing more than just some suitably-arranged dots, that Lewis's picture is somehow already accounted for in the existence and arrangement of the pixels, etc., and that there is a clear analogy between Lewis and Pettit's picture and shapes and our own world's higher-level objects.[17]

Indeed, a relatively wide range of philosophers – physicalistically inclined and otherwise – appear to have found something like MRI compelling. Examples include (as above) Lewis and Pettit, but also Swinburne, who claims that 'there is nothing more to large-scale material objects except the fundamental particles and the relations these have to each other' (1995: 395), and Eddington, who describes the scientific conception of a table as being merely 'numerous electric charges rushing about with great speed' in an otherwise empty void and clarifies that the 'scientific table is the only one which is really there' (1929: x-xi). We're probably justified in adding supporters of CAI to the list as well, since those who end up endorsing CAI typically do so at least in part because they find it intuitive that composite objects reduce$_{LP}$ to their parts (Baxter 1988: 579, Payton 2021: S4571-2). The same is true of those who instead say that composition is analogous to but weaker than identity (thereby endorsing what is often called 'weak' CAI): they often motivate their view in part by appeal to intuitions along the lines of MRI (e.g. Lewis 1991: 81-5; Sider 2007: 54-5).

In what follows I assume that we should try to preserve MRI. I turn now to arguing that it's dubious that any view other than microphysical manyism is capable of doing so.

3.2 – How (and How Not) to Capture MRI

Actual and possible attempts to capture MRI divide into identity-theoretic accounts of the relation between higher-level objects and microphysical goings-on and non-identity-theoretic accounts. I'll first argue that that non-identity-theoretic accounts have little hope of capturing MRI; I'll then argue that the same is true of identity-theoretic accounts other than microphysical manyism.

3.2.1 – Non-Identity-Theoretic Accounts

Non-identity-theoretic accounts of course vary depending on which relation they take to hold between higher-level objects and microphysical goings-on. Some such relations are clearly too weak to underwrite MRI. This includes the supervenience relation that Lewis says suffices for the reduction$_{LP}$ of the picture to the dots (1994: 413-4): the reduction$_{LP}$ of higher-level objects to microphysical goings-on requires the nothing-over-and-above-ness of the former with the respect to the latter, but in light of e.g. the trivial supervenience (but not nothing-over-and-above-ness) of necessary beings like numbers on everything (Stoljar 2017) and the coherence of the property dualist view according to

[17] For those unconvinced of the analogy, here's a quick argument: imagine picking up the dots that are currently arranged into a two-dimensional circle and rearranging them instead three-dimensionally, in exactly the same way that some fundamental physical particles that make up a table are arranged; imagine also that the dots are made to bear to one another all of the same relations that the particles that make up the table bear to one another, and that they are similarly endowed with all of the same monadic properties as those particles. It seems that the dots now simply *are* some fundamental physical particles, and that they make up a table in just the same way as the ones upon which they were modelled do. But the process of rearranging the dots and altering their properties doesn't seem to have changed anything important about the nature of their relationship to the thing that they make up. If the circle reduces$_{LP}$ to the dots that make it up, then so should the table.

which mental properties are something over and above but nevertheless supervenient on physical properties (Wilson 2005: 430ff.), it is nowadays received wisdom that supervenience does not suffice for nothing-over-and-above-ness (Horgan 1993). But there is additionally a more general argument that supports the claim that *no* relation weaker than identity that can be said to hold between higher-level objects and the microphysical is strong enough to secure the reduction$_{LP}$ of the former to the latter.

First, consider as an illustrative example Pettit's attempt to capture MRI. Pettit claims that the reduction$_{LP}$ of higher-level objects to microphysical goings-on is secured by the way in which the former *depend* on the latter (1995: 144), where the nature of this dependence is such that 'once the microphysical conditions and the microphysical laws have been fixed, then all the crucial features of a world like ours will have been fixed' (1993: 219)'. As Pettit puts it: 'given the dots and only the dots, the shapes come for free. And in my language that means that the shapes reduce to the dots' (1995: 143). But this is objectionable for the following reason. As we've seen, MRI entails that higher-level objects are nothing over and above microphysical goings-on in the sense that a complete inventory of the world could without error fail to mention the higher-level objects. But Pettit's characterisation of the relationship between microphysical goings-on and higher-level objects seems instead to constitute an argument for the *in*completeness of any inventory of reality that mentions only the microphysical goings-on: such an inventory must be incomplete because it doesn't include the higher-level objects that, given what Pettit says, must exist if microphysical goings-on do. The fact that the reason we have to add higher-level objects to our inventory is just that our inventory already contains the microphysical goings-on doesn't mean that we don't have to add higher-level objects to our inventory. Indeed, in the absence of the claim that higher-level objects are *identical* to microphysical things already in our ontology, it means quite the opposite. As such, it seems to me that the dependence of higher-level objects on the microphysical cannot secure MRI.

The general argument against non-identity-theoretic accounts is simply the generalisation of the foregoing. No matter what relation we say holds between higher-level objects and the microphysical, be it constitution, realisation, grounding, or whatever, if it is weaker than identity then the following is true: the existence of the constituted/realised/grounded higher-level object might be automatically necessitated by the existence of the microphysical goings-on, the higher-level object might depend on and have all of its properties determined by the microphysical goings-on, etc., but since the higher-level object is necessitated, and/or dependent, and/or has all of its properties determined by microphysical goings-on, etc., it must *exist*, and since it is by stipulation not identical to something already inventoried, an inventory of what exists would not be complete without its addition (cf. Merricks 2001: 28). Therefore the higher-level object does not reduce$_{LP}$ to the microphysical.

Indeed, I take it that it is on these sorts of grounds that it is widely accepted that genuine ontological reduction is or implies identity (e.g. Kim 2008: 94; Wilson 2014: 541-2n18). Of course, not everyone agrees. Most notably, there is a tradition going back to Lewis (1991: 81-7) of simply stipulating that the composition relation is 'ontologically innocent' in precisely the sense that composite wholes can be omitted from an inventory of reality that mentions only their parts, despite parts and whole being strictly speaking non-identical (the resulting view is the 'weak' version of CAI mentioned above). Perhaps we should similarly understand Pettit as simply stipulating the same of the dependence relation he cites.[18] My official response is simply that such a stipulation must be illicit for the reasons

[18] A reviewer suggests that an alternative defence of the idea that non-identity-theoretic accounts can capture MRI might be that such counts can subscribe to a certain background claim about *what it means* to draw up a

given (see also Yi 1999: §§3-4). But here's a back-up reply: at the very least, it should be admitted that claiming to have captured MRI with a weak-CAI-style view has the significant drawback of making it a *mystery* how higher-level objects can both exist but without error be excluded from in an inventory of reality, despite their distinctness from anything that has already been inventoried (cf. Wallace 2011: 809). It would surely be at least much *better* to capture MRI via an explanatory account that makes sense of how MRI can be true. Indeed, as I understand the term, such an explanatory account is required in order to say that MRI has really been 'captured' at all, as opposed to merely stipulated. So I think it's reasonable to conclude that it is dubious that non-identity-theoretic accounts of the relationship between higher-level objects and microphysical goings-on offer a promising way to properly capture MRI, at least in the sense of 'capturing' an intuition that is most theoretically advantageous, and to turn instead to identity-theoretic accounts of higher-level objects, which look to be more promising in this regard.

3.2.2 – Identity-Theoretic Accounts

If *x* is identical to *y*, then the idea that there can be a complete inventory of reality that mentions *y* without (explicitly) mentioning the nevertheless existent *x* is no more mysterious than the idea that there can be a complete list of party-goers that mentions Clark Kent but doesn't (explicitly) mention Superman. This bodes well for the possibility of properly accounting for the reduction$_{LP}$ of higher-level objects to microphysical goings-on via an identity-theoretic account. I argue here, though, that microphysical manyism is the only such account that really can capture MRI.

It's useful to divide identity-theoretic accounts of the relationship between higher-level objects and microphysical goings-on into four variants, individuated by the kind of identity claim being made:

(1) The identity claim is one-one: each higher-level object is an individual that is identical to some individual microphysical 'going-on'.

(2) The identity claim is one-many: each higher-level object is an individual that is identical to some proper plurality of microphysical goings-on.

(3) The identity claim is many-one: each higher-level object is a proper plurality that is identical to some individual microphysical 'going-on'.

(4) The identity claim is many-many: each higher-level object is a proper plurality that is identical to some proper plurality of microphysical goings-on.

(3) is not endorsed by anyone, and inherits both (1) and (2)'s problems (see below) without apparent redeeming features. I leave it aside here. Microphysical manyism is a version of (4). So I focus first

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complete inventory of what exists. According to this background claim, drawing up a complete inventory of what exists does not require drawing up a list of literally every distinct thing that exists, but rather only requires drawing up a list of what exists *fundamentally*. If higher-level objects are not fundamental but rather derivative of microphysical goings-on, then a complete inventory can omit the higher-level objects. I don't (here) have any quarrel with this idea, but I do deny that it represents a way to capture MRI. MRI simply isn't the claim that higher-level objects reduce to microphysical goings-on in the sense that a complete inventory of *fundamental* goings-on need not include higher-level objects (a claim which can be accepted even by those who think that non-fundamental goings-on are something over and above fundamental goings-on, that fail to reduce to fundamental goings-on, and/or that amount to extra theoretical posits with respect to the fundamental goings-on [cf. Baron and Tallant 2018, Thunder 2021]): it is the claim that a complete inventory of absolutely everything, fundamental and otherwise, can fail to include higher-level objects, despite those objects' existence.

on (1) and (2). Neither, I claim, is capable of properly capturing MRI.

(1) is sometimes regarded as the only the way to be a reductionist about higher-level objects. The only plausible version of it involves an appeal what Wilson has characterised as *ontologically lightweight combinations*. Wilson writes:

> 'The reductionist maintains, contra any metaphysical emergentist, that all goings-on, including apparently 'higher-level' goings-on, are in fact identical to some or other complex combination of 'lower-level' ultimately physical goings-on.' (2021: 12)

Thus, she claims, in order for reductionism to be made sense of we must say that

> 'the level of physical goings-on [… contains not only] quarks and electrons standing in relatively noncomplex physical relations, but also massively complex pluralities or structural aggregates of such particles and relations (where the relations at issue include lower-level causal, spatiotemporal, mereological, and other ontologically 'lightweight' modes of combination), of the sort that might potentially serve as the candidate physicalist reduction base for macro-entities such as tables, planets, and persons […]' (12-3)

Other putative examples of this sort of ontologically lightweight combination are 'boolean' combinations (Wilson 2011: 121n1, 122) and sets (DiFrisco 2018: 312) of microphysical entities. The suggestion, then, is that one – or perhaps the only – way to be a reductionist about higher-level objects is to (one-one) identify each of them with some or other ontologically lightweight combination.[19]

But even if this were right, such an identification would not be a way of satisfying MRI. The problem is that the identification of higher-level objects with combinations of microphysical objects/relations secures only the reduction$_{LP}$ of higher-level objects to those combinations, not to microphysical objects/relations themselves. This would satisfy MRI only if it could be maintained that the combinations count as microphysical goings-on. But this is implausible: the combinations may well be *physical* (which is all that Wilson, DiFrisco, etc. suggest), but they are not plausibly *micro*physical – if they're big enough to be identified with things like trees or planets then they're hardly *micro*. Or at least, they're not the sorts of microphysical goings-on that MRI claims higher-level objects to reduce$_{LP}$ to. MRI is supposed to express the intuition that higher-level objects are somehow already accounted for in the existence and nature of the microphysical particles (not the particles *plus* things made out of the particles), that a complete inventory of reality need mention nothing more than just the microphysical particles (not the particles *plus* sets/fusions/relational aggregates of the particles), that 'given the dots and only the dots, the shapes come for free' (Pettit 1995: 143) (not 'given the dots *plus* ontologically lightweight combinations of the dots…'). We cannot satisfy MRI via (1).

Versions of (2), on the other hand, seem to avoid the problems associated with (1), since they identify higher-level objects with proper pluralities of microphysical entities themselves. The most natural way to interpret (2) is in line with CAI: each higher-level object is an individual that is nevertheless identical to the proper plurality of its microphysical parts.[20] Indeed, as noted above, CAI is often proposed as a way of capturing the claim that composite objects reduce$_{LP}$ to their parts, a claim that entails MRI.

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[19] Others who appear to characterise the reduction of higher-level things in terms of their identity with combinations of lower-level things include Causey (1972: 176), Enç (1976: 286), and Hellman and Thompson 1975: 554-5; 1977: 310).

[20] Might the proper plurality in question additionally contain properties or relations of microphysical particles? Since such a view seems to face the same objections as the ones that I'll raise for CAI, I will leave it aside here.

Nevertheless, it is dubious that CAI (or any other version of (2)) is a good way to capture MRI. One reason for this is that CAI is beset by a whole host of difficulties, not least the objections that identity – governed as it is by Leibniz's Law – cannot hold between one thing on the one hand and many things on the other, that CAI in fact entails the non-existence of composite objects (and ergo of higher-level objects) (Calosi 2016; Loss 2018, see also Yi 2021), and that CAI has ruinous consequences for (and therefore deprives us of the highly useful tool of) plural logic (Sider 2007). There are of course defences of CAI against these objections, but it is fair to say that most would rather reject MRI than have to pay for its acceptance with CAI. But even if we ignore the general difficulties facing CAI, there is another reason for doubting that it – or indeed any form of (2) – represents a good way to satisfy MRI. Consider that if higher-level objects are each individuals that are one-many identical to proper pluralities of microphysical entities, then a condition on there being higher-level objects is that there are proper pluralities that are each one in number (in addition to being many in number). If no proper plurality of microphysical entities were one in number then no such proper plurality could be a relatum of an instance of the one-many identity relation, since if it were then it would be identical to a 'one' and thus itself one in number after all. But this arguably violates MRI: assuming that higher-level objects exist, and given CAI, an inventory of what exists that lists only microphysical entities is not complete until we additionally specify that some pluralities of those entities are jointly one in number. That is, given the CAI-ist's claim that what it is for a composite object to exist is for a plurality of things to be jointly one in number: an inventory of what exists that lists only microphysical entities is not complete *until we additionally specify that there are composite objects in the inventory too*.[21] Similarly, on CAI, it would seem to be false that there is 'nothing more to large-scale [/higher-level] material objects than fundamental particles and the relations these have to each other' (Swinburne 1995: 395): 'to' each higher-level object there would additionally be *joint oneness* of the proper plurality of particles and/or relations to which it is allegedly one-many identical. I therefore take it to be dubious that MRI can be satisfied by any form of (2).

That just leaves (4), which is tantamount to microphysical manyism.[22] Microphysical manyism does not face the objections I've raised for (1) and (2). It avoids the objection facing (1) by identifying higher-level objects with proper pluralities of microphysical particles themselves, rather than with individual combinations of those particles. It avoids the objections facing (2) by denying that higher-level objects are 'ones' and claiming them instead to each be mere proper pluralities (that are not also individuals, and) that are identical to proper pluralities of microphysical particles. This means not only that microphysical manyism avoids the myriad general difficulties associated with countenancing one-many identities, but also that it does not say that the existence of higher-level objects requires that some proper pluralities of particles be jointly one in number in addition to being many in number. Rather, given microphysical manyism, the existence of higher-level objects requires only the mere existence of the particles (the 'dots and only the dots').[23] Indeed, microphysical manyism can

[21] That this is an *additional* specification follows from the fact that it is perfectly logically and conceptually consistent with CAI that no plurality of microphysical entities is jointly one in number (see Cameron [2012], who makes an argument along similar lines that, given CAI, the existence of some parts does not necessitate the existence of a whole composed those parts). Thanks to a reviewer for pressing me to be clearer here.

[22] A non-microphysical-manyist version of (4) would treat higher-level objects as proper pluralities of particles *and* properties/relations of those particles. I find it objectionable to reify properties/relations in the way that would be necessary for such a view. That said, I cannot offer a full discussion here, and the unconvinced may take the conclusion of my argument here to be the disjunction of microphysical manyism and this alternative version of (4).

[23] Of course, for those higher-level objects to qualify as *molecules* or *organisms* or *planets*, etc., they must meet

maintain that higher-level objects are nothing over and above microphysical goings-on in precisely the sense that the former can be omitted from mention in an inventory that lists only the latter, that there is a sense in which the empirical world contains only what a true complete microphysics would say it contains, that higher-level objects are already accounted for in the microphysical goings-on, and that there really is nothing more to higher-level objects than suitably-arranged and -interrelated microphysical particles.

3.2.3 – From MRI to Microphysical Manyism

I conclude that, to the extent that we care about satisfying MRI, we should be attracted to microphysical manyism. It is dubious that any other view can consistently maintain that higher-level objects reduce$_{LP}$ to microphysical goings-on. Since – as above – MRI represents a relatively widespread intuition that is particularly likely to be compelling to physicalists, this amounts to a strong physicalist case for microphysical manyism.

4 – Conclusion

I have presented two arguments for microphysical manyism. In the first, I argued that proper pluralities of microphysical particles do everything that we think of higher-level objects as doing, and as such that the Canberra Plan – a methodology that has been deployed in defence of a range of physicalist views – recommends identifying the latter with the former. In the second, I argued that such an identification preserves the powerful, physicalist-friendly intuition that higher-level objects are, at root, nothing more than microphysical goings-on. I conclude that at least the physicalistically inclined among us have good reason to accept microphysical manyism.[24]

Statements and Declarations

I have no conflicts of interest to report.

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further conditions, but that is both unsurprising and consistent with MRI. Contrast this with CAI, according to which the mere existence of higher-level objects – quite apart from whether they qualify as molecules etc. – requires the joint oneness of certain proper pluralities of particles.

[24] I'm grateful to Jonathan Tallant, Dave Ingram, Alessandro Torza, Nikk Effingham, David Liggins, Ross Cameron, Trenton Merricks, audiences at the University of Nottingham, the University of Virginia and the National Autonomous University of Mexico (UNAM), and to two anonymous reviewers for *Erkenntnis*.
I gratefully acknowledge that I wrote part of this paper whilst employed on a postdoctoral research programme at UNAM, the details of which are: UNAM, Programa de Becas Posdoctorales en la UNAM, Becario del Instituto de Investigaciones Filosóficas, asesorado por el doctor Ricardo Mena Gallardo.

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