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# Handbook of Metaphysics and Ontology Volume 2 L–Z

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thing-or-other intrinsic to objects and additive in all their normal combinations".

Of course this 'solution' raises the old Lockean problem, recognized by Armstrong, of an unknown substratum: as Howard Robinson (1982) has recently argued, the scientific realist's last-ditch response seems to be that matter's inherent nature is a 'nameless categorical residue' which is designed to stop, by definition, the regress from one set of dispositions to another. It is significant that experimental results, and not the speculations of philosophers, have forced the issue to take this form. Physicists keep finding more new primary qualities, but all of them seem dispositional. Thus the philosopher who wishes to avoid non-realist positions like phenomenalism or idealism is forced either to postulate an end to the reduction of dispositions to further dispositions, or else to accept the conceptual problems associated with the view that material bodies have only dispositional properties.

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## Mass Terms

The first question that should be answered here is what is a mass term? Most works, unfortunately, do not answer this basic question, but instead give examples from which the reader is to formulate his own concept of what a mass term is. A traditional opposition is between mass terms and count terms – although the notion of what a count term is most often also goes unanswered. (And in any case, most theorists believe there to be many terms which are neither count nor mass.)

Most commonly, mass and count terms are presented by example: *water* is a mass term, *person* is a count term; *computer software* is a mass term, *computer program* is a count term; *furniture* is a mass term, *house* is a count term. Sometimes these examples are accompanied by explanations like the following:

1. Count terms (but not mass terms) can occur with the quantifiers *each, every, many, few*, and *some* (as a stressed quantifier). Count terms (but not mass terms) can occur with the indefinite article. Count terms (but not mass terms) can occur with counting phrases like *three* or *a dozen* (*of*). Count terms (but not mass terms) exhibit a singular/plural dichotomy manifested both in the term itself and in verb agreement. On the other hand, mass terms (but not count terms) can occur with the quantifiers *much* and *little*. The indefinite article appropriate to mass terms (but not appropriate to singular count terms) is the unstressed *some* (which will be written as *sm* in what follows). Mass terms (but not count terms) can be used with measurement phrases like *amount of* and *litres of*. Mass terms do not have a plural form.
2. Count terms refer to discrete, delineated entities; mass terms refer to undifferentiated stuff. Count terms 'contain within themselves a principle of individuation'; mass terms refer without explicitly individuating their referent into objects. Mass terms (but not count terms) have 'cumulative reference': given any group of parts of which the mass term is true, the mass term is also true of their sum. Mass terms (but not

count terms) also have 'homogeneous (or divided, distributive, divisive) reference': given anything of which a mass term is true, the term is also true of its parts.

3. Count terms (but not mass terms) are used by speakers when they wish to indicate that they know how to individuate a certain portion of the world from another portion; they are used when the speaker understands how one instance is marked off from another instance of the count term. Mass terms are used when the speaker wishes to identify one aspect of the world, but not with any intent to individuate. The main test here is that, given a space appropriate to an expression $E$, if it makes sense to ask how many $E$s are in that space then $E$ is a count term.

**Does Mass/Count Apply to Anything Besides Noun Phrases?** From the three types of characterization just stated, it is obvious that the mass/count distinction is primarily thought to apply to noun phrases. But, some authors have also suggested that it might be extended to other types of expressions. Adjective phrases (e.g., *spherical*) might be called count because they can only be applied to count nouns. Verbs which can only take mass (or count) subjects might thereby also be called mass (or count) – assuming there are any such verbs. This sense in which an element from a syntactic category other than NP might be called mass or count is probably better treated as an agreement feature. It is certainly not the case that these adjective phrases or verbs have any properties which are in any sense analogous to the count/mass distinction amongst NPs. It has, however, been noted that there might be the appropriate kind of analogy within verb phrases. The idea is that the denotation of a VP is an event, and that events can be parts of larger events and can contain subevents. Sometimes these subevents can be described by the same verb phrase – especially when the event in question is a process such as *to eat* or *to run*. Other VPs (such as *to win* or *to prove*) describe achievements and involve the attainment of some final state. Such events do not have subevents which can be described correctly by the VP.

Once this basic analogy is discovered, one can investigate the effect of adding a mass or a count direct object to a mass or count verb – trying to decide whether the resulting VP always inherits the mass or count feature from the verb or from the object. Similarly, one can consider adverbial phrases to be mass or count by analogy. Adverbs like *for hours* are temporally 'unbounded', ones like *along the road* are spatially 'unbounded'. Adverbs like *in an hour* are temporally 'bounded', ones like *to the city* are spatially 'bounded'. One might think of the 'unbounded' adverb phrases as mass-like, and the 'bounded' ones as count-like. Again, one might investigate the effect of adding these mass and count adverbs to a verb which is basically mass or count; and indeed one might investigate the overall effect of mass/count verbs, mass/count objects, and mass/count adverbs. Discussions of these phenomena can be found in many places, but see especially Mourelatos (1978), Hoepelman (1976), and ter Meulen (1980). For the remainder of this article we will stick to mass/count as a property of NPs.

**Do the Criteria Really Distinguish Anything?** The three types of criteria listed above which have been used to distinguish mass from count terms fall into three different categories of tests: syntactic, semantic, and pragmatic, depending upon whether one views the mass/count distinction as giving conditions on well-formedness, on reference, or on how people differentially use various terms. To evaluate the usefulness of any of these different categories in any detail is beyond the scope of a short survey article, but the following (negative) points might be noted. As regards, first, the pragmatic distinction: it has been convincingly argued by R. X. Ware (see Pelletier 1979, pp. 15–29) that in most instances speakers simply have no intentions that are relevant. The very same 'communicative intentions' might lead a speaker to say *a lot of difference* and *many differences*, or to say *much more data* and *many more data*. Speakers might have 'mass-like intentions' when they ask for more beans or more eggs – should that make *beans* and *eggs* mass? Should the fact that speakers might have 'individuating intentions' when they ask for more toast or more eggs make *toast* and *eggs* count? The pragmatic criterion seems doomed. As regards the semantic distinction: it seems that there is nothing in the referent of the terms that should make *fruit* mass and *vegetable* count, *baklava* mass and *brownie* count, *rice* mass and *bean* count. Furthermore, different languages sometimes use (alleged) count terms and sometimes (alleged) mass terms to refer to the same thing. (Consider the English *dandruff* which is (allegedly) mass, and the French *les pellicules* which is (allegedly) count. Consider also *dish(es)* vs. *la vaiselle*.)



Furthermore, as F. J. Pelletier has pointed out, for any allegedly count term that denotes a physical object there is a related term which is arguably mass (see Pelletier 1979, pp. 1–14; this work also contains a discussion of the applicability of the distinction to terms denoting non-physical objects). Consider the 'Universal Grinder', a device that takes in an object corresponding to the count term and spews out the finely ground matter of which it is made. A hat, for instance, is fed into it and afterwards there is hat all over the floor. This is so despite the fact that there is another word we might have used (for example, *felt* or *straw*). So for any word one would wish to call a count term, there is a related mass term designating, roughly, the stuff of which it is made. Conversely, universal objectifiers come to mind. In any case, whenever standard portions or standard uses for the stuff corresponding to a mass term have been established, one will find a count term for it: three beers, an ice cream, a finely silted mnd. There is also the count term (for any mass term $M$) which means, roughly, *a kind of M*.

Given the foregoing, it is not surprising that even the syntactic criteria have been attacked. It just is false, for example, that *mud* cannot occur with numeral modifier, or the indefinite article. It is false, for example, that *soldier* does not occur with the unstressed *sm*. After the grenade has exploded in the enemy bunker, Rambo might enter and notice that the walls contain three different muds mixed with sm soldier.

The failure of any of the different types of criteria to divide even nouns into separate classes suggests that nouns or noun phrases considered in the abstract or in isolation are not what *mass* and *count* should apply to. Instead, perhaps, it should be the noun phrase *as it is used in a particular sentence* which should be classified as either mass or count. Thus it will not be a word, not even a word in a sentence, which is count or mass; rather it is the entire NP as it appears in the specific sentence under consideration which is to be judged count or mass. This would seem to suggest that the distinction is not a matter of syntax, for the same noun might in one sentence be in a count NP and in another be in a mass NP. A syntactic distinction, after all, is supposed to enforce a well-formedness constraint; but we have just seen that any noun can be used in either a mass or a count way . . . no constructions would be ruled out by such features and so they cannot be syntactically motivated.

Instead, they should be viewed as semantic 'directives' telling us how to evaluate the NP as it occurs in some sentence. In sentences like *I had lamb for dinner* and *Apple was in the salad* the 'directive' might be to interpret *lamb* and *apple* in a way that is true of certain kinds of stuff regardless of how much of the stuff there is (and regardless of how many naturally occurring objects the stuff was derived from). In sentences like *I had a lamb for dinner* and *An apple was in the salad* the 'directive' would interpret them as true only if there was an entire naturally occurring object (a lamb or an apple) which satisfied the sentence. This suggests that there should be sentences in which there is an ambiguity as to what the 'directive' is; and indeed this seems to be precisely what happens when the (alleged) mass term has the same form as the (alleged) plural count term. Sentences like *John likes his data, Mary had potatoes for supper*, and the like are ambiguous in just this way. Furthermore, it explains the ambiguity of such sentences as *This tavern has sixteen beers* (kinds vs. individual portions) and *This bunker contained four soldiers* (individuals vs. kinds of soldiers – e.g., from different countries).

**What Ontology do Mass Terms Presuppose?** The ontology presupposed by this outlook on mass terms is this. First, there are

ordinary individuals such as Ralph, this ottoman, and the beer in the bottle before me. Such items are in the extension of such predicates as *is a person, is furniture, is a beer*, and *is beer*. Second, there are kinds: *Homo sapiens*, Furniture, Beer. The kinds ought to be thought of as forming an upper semi-lattice of kinds. Thus, Beer might be atop the semi-lattice with Pilsner, Lager . . . etc., falling under it. This is a 'formal' semi-lattice in the sense that the union of any two kinds in the lattice is also a member of the lattice. These kinds are denoted by an entire NP (e.g., by *beer, pilsner, lager*) and are all in the extension of the predicate *is X* where *X* is the name for the top of the lattice. Thus, we have *pilsner is beer, lager is beer*, and even *beer is beer*. Predications of this sort are ambiguous (or perhaps one meaning is derived from the other by virtue of meaning postulates) between interpreting the subject NP as denoting a member of the semi-lattice and being universally quantified with the subject term treated as a predicate.

Some of these kinds (roughly: those which are conventionally recognized as an important kind of *X*) are *conventional kinds*, and they are in the extension of the predicate *is an X*. Thus, *pilsner is a beer* and *lager is a beer* are true. But not every member of the formal semi-lattice is a conventional kind – for example lager mixed with pilsner is not *a* beer (although it is beer), beer is not *a* beer (since it is not a conventionally recognized kind of beer).

It is implausible to suppose that these kinds can be identified with any physical object such as the mereological sum or fusion:

1. (Due to Montague, see Pelletier 1979, pp. 173–78.) Consider two possible but as-yet unrealized substances, Kaplanite and Suppessium. They are defined in such a way as to be distinct (e.g., by having different atomic numbers) but their mereological sums are identical, namely the null individual.
2. The mereological sum of water is all the water in the world, but *all the water in the world weighs billions of tonnes* is true while *water weighs billions of tonnes* is nonsensical.
3. (Due to T. Parsons, see Pelletier 1979, pp. 137–66.) All the wood in the world might be made into furniture and all the furniture made of wood, so the mereological fusions of wood and furniture would be the same. Yet even so, wood and furniture are distinct (because, e.g., this chair leg would be wood but not furniture).

It seems that the kinds must be intensional entities.

One might wish to distinguish between ordinary objects and the particular quantity of matter which comprises them. One might therefore distinguish between my ring and the specific quantity of silver of which it is made. In this case, these quantities will also be in the extension of such predicates as *is silver*, in addition to the objects. Of course, for this example *is a silver* is not true of either the ring or of the quantity of matter. But this is not always the case: both *is an apple* and *is apple* are true of the object before me, but arguably only *is apple* is true of the quantity of matter of which the object is made. After Rambo enters the bunker, *is soldier* but not *is a soldier* is true of what he finds on the walls.

In addition to the preceding uses, there is also the use of (say) *a beer* to refer to an individual serving of beer. It is not clear whether this use refers to the contents – that is, the individual quantity – in the serving or to the size (or amount) of the serving. As we have seen, *is beer* is true of the contents of the serving, but if this use of *a beer* referred to the amount rather than the contents then a waiter could bring that amount of water in response to an order of a beer. On the other hand, if *a beer* refers to the actual quantity, then *a beer is beer* (when *a beer* is used in this manner) ought to be necessarily true. But it is not clear that this is so.

Finally, there is also the use of such phrases to refer to conventionally recognized *types* of servings. This is the sense in which, although the five of us at the table each have a beer, there are only three (distinct) beers on the table: a pint, a 12 oz. bottle, and a 7 oz. glass. (Those are standard types of servings in certain areas of North America.) Again, for reasons similar to those given above with regard to kinds, it seems that these conventionally recognized types of servings cannot be identified with any physical manifestations.



**What is the Origin of the Mass/Count Distinction?** Considerations such as the above might lead one to speculate as follows. Our language is suited to picking out certain features of the world – redness, watery-ness, human-male-ness, and the like. It does this by having predicates which are true of these aspects of reality: *is red, is water, is man*. Such predicates are true of any appropriate aspect of the world, including the parts of such an aspect (thus such predicates pass the divisive and cumulative tests). Often, however, what we find interesting about reality is not merely the fact that reality manifests this feature but also that this particular region of reality has some further use. Such uses are determined by physics, or biology, or culture, or merely personal whim; they can often seem completely haphazard. But if the utility is great, we associate an 'object' with particular manifestations of that feature. If the utility in doing this is very great, the other 'feature placing' use will slip into the background – but it will still be there and can be called upon when the circumstances are right. Thus, *potato* describes a certain aspect of reality, and the predicate *is potato* is true of that area of the world (and of its parts). If, however, agriculture or food selling makes it convenient to look at the various areas of reality of which this predicate is true as being discrete from one another and each area as having its own uniqueness, we might decide to talk about *one potato, two potatoes, a potato, each potato* . . . inventing, as it were, a 'count term'. But the original 'feature placing, mass-like term' still remains and is still used when the circumstances are appropriate (as in ordering some food). For whatever reason, such a count use of *potato* is common; but the same thing did not happen to *garlic*. Sometimes the utility is so great that the 'feature placing, mass-like use' becomes so rare as to almost never come to mind. No doubt due to the importance of our interpersonal relationships, *is man* hardly ever is used while *is a man* is very common. But as the universal grinder, the Rambo story, and such uses as *what a hunk of man!* illustrate, the 'mass like' use is still there waiting for appropriate circumstances. This also explains why universal objectifiers can be imagined: we can conceive of special occasions (or maybe just whims) in which it would be useful to treat these features of reality as objects.

It is difficult to account for the bewildering set of examples wherein one is tempted to call a use of a term mass vs. count. There seems to be nothing in the reality referred to which would explain why we say that we sell fruit (mass?) but that we sell vegetables (count?). There also seems to be nothing in the (conscious) communicative intentions that could explain it. And in any case, it seems that every term could be used in either way, given the right circumstances. The above story, where this is described in terms of 'feature placing' plus communicative utility modulated by historical accident, is offered as one possible explanation. Doubtless there are others.

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## Materialism, Physicalism

Materialism at its simplest holds that everything is composed of matter, and that the properties of matter determine all properties of things, persons included. *Physicalist* materialism, or *physicalism*, merely replaces matter in this scheme with whatever entities or processes are taken as basic by math-