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Article

What is ontic vagueness?

O que é vagueza ôntica?

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ABSTRACT

There is ample divergence among students of vagueness as to what exactly should be understood by a vague object, or by ontic, or metaphysical vagueness in general. In fact, the very intelligibility of the notion of a vague object has been called into question by important philosophers in the past, indicating that the task of finding a coherent, philosophically fertile characterization of the notion is not a simple one. This article aims to contribute to this undertaking, by identifying, examining and comparing some of the main proposals in the literature. It is suggested that we should try to characterize vague properties and relations independently of any particular view about vague objects, and then to formulate a criterion for vague objects in terms of indefinite instantiation of sharp properties. It is shown that this approach makes it easier to evaluate certain semantic-epistemic dismissive strategies concerning the possibility of there being vague objects. It is briefly indicated that if the objects are analysed with the theoretical and conceptual resources of quantum physics (and not of classical physics, as is ordinarily done), such dismissive strategies are seriously undermined.

Keywords: ontic vagueness, metaphysical vagueness, vague objects, sharp properties.

RESUMO

Há ampla divergência entre os pesquisadores da vagueza, em filosofia, quanto ao que exatamente deve ser entendido por um objeto vago, ou por vagueza ôntica ou metafísica em geral. De fato, a própria inteli-

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gibilidade da noção de um objeto vago foi questionada por filósofos importantes no passado, indicando que a tarefa de encontrar uma caracterização coerente e filosoficamente fértil da noção não é simples. Este artigo visa a contribuir para esse empreendimento, identificando, examinando e comparando algumas das principais propostas encontradas na literatura. Sugere-se que devemos tentar caracterizar propriedades e relações vagas independentemente de qualquer posição particular sobre objetos vagos e, então, formular um critério para objetos vagos em termos de instanciação indefinida de propriedades nítidas. Mostra-se que essa abordagem facilita a avaliação de certas estratégias semântico-epistêmicas que negam a possibilidade de haver objetos vagos. Indica-se brevemente que se os objetos forem analisados com os recursos teóricos e conceituais da física quântica (e não da física clássica, como é feito ordinariamente), tais estratégias de negação da existência de vagueza ôntica ficam bastante fragilizadas.

Palavras-chaves: vagueza ôntica, vagueza metafísica, objetos vagos, propriedades nítidas.

Students of vagueness typically disagree as to what exactly should be understood by a vague object, or by ontic or metaphysical vagueness in general. This debate, that gained impetus in the 1990's, arose in an adverse context. As is well known, in his seminal 1923 article on vagueness, Bertrand Russell maintained that "[v]agueness and precision alike are characteristics which can only belong to a representation", linguistic or mental. To attribute vagueness to the represented objects would be, according to him, to commit the "fallacy of verbalism – the fallacy that consists in mistaking the properties of words for the properties of things" (Russell, 1923, p. 85). Also, an often-quoted phrase of Michael Dummett's says that "the notion that things might actually *be* vague, as well as being vaguely described, is not properly intelligible" (1975, p. 314). David Lewis agrees: "The only intelligible account of vagueness locates it in our though or language. The reason it's vague where the outback begins is not that there's this thing, the outback, with imprecise borders; rather, there are many things, with different borders, and nobody has been fool enough to try to enforce a choice of one of them as the official referent of the word 'outback'. Vagueness is semantic indecision." (1986, p. 212). Also, a particularly influential line of argument against ontic vagueness derived from an alleged proof that there can be no vague identity statements containing only precise singular terms (Evans, 1978).

Although nowadays the arguments against ontic vagueness put forward by Russell, Dummett, Evans, Lewis, among others, no longer deter research into the topic, the fact that the very intelligibility of the notion of a vague object has been called into question by such important thinkers indicate that the task of finding a coherent, philosophically fertile characterization of the notion is not a simple one. This article aims to contribute to this undertaking, by identifying, examining and comparing some of the main proposals in the literature.[2]

It is difficult to characterize vagueness *in general* without prejudging the issue in favour of one or another of the main interpretations of vagueness (semantic, epistemic, ontic). Arguably, the central element in the notion is the existence of a *fuzzy boundary*. Vagueness is also commonly defined in terms of *borderline cases*.[3] Thus, according to the semantic interpretation, a *word* is vague if its meaning is not

[2] Any defence of ontic vagueness presupposes, of course, the refutation of these negative analyses, and in particular of Evan's proof. Sorensen (2018) makes a useful, if compendious, survey of the several ways in which this proof has been questioned in the literature, and of the main roads open to those sympathetic to ontic or metaphysical vagueness. See also the discussions in the papers of Part IV of a recent collection published by Akiba and Abasnezhad (2014), and chapters 2 and 3 of Elisabeth Barnes's PhD dissertation (2007).

[3] The existence of borderline cases follows from the existence of fuzzy boundaries, whereas the converse does not seem to hold (Keefe and Smith, 1997a, pp. 15-16; see also Sainsbury, 1997, sect. 5), so the definition in terms of fuzzy boundaries is more general. The opposite position is adopted, for instance, in Bueno and Colyvan, 2012; but their preferred option is to define vagueness in terms of sorites susceptibility. Notwithstanding its interest, this approach will not be examined here, since it is applicable only to predicates, not to objects. I just notice that despite the generality of the question in the title of their paper ("Just what is vagueness?"), it does not even mention the possibility of there being ontic vagueness. Since it ignores also the possibility of vagueness being an epistemic phenomenon, its title turns out to be quite misleading.

precise. Vagueness is semantic indecision, as Lewis put it. Proponents of the *epistemic* interpretation maintain, in their turn, that vagueness results from imprecise knowledge as to whether an object or process has a certain property, or stands in a certain relation to other objects or processes.[4]

As to *ontic* or *metaphysical* vagueness, a straightforward, general definition is that it is the view that, in some sense, the world itself is fuzzy.[5] But this characterization is much too vague. The world can be understood as containing objects, properties, relations, processes, properties of properties and relations, properties of processes, etc. Undoubtedly, thoughts on, and statements about, or involving these items are usually vague. Is vagueness restricted to the mental and linguistic levels, or can it also be taken as extending to these basic ontological elements too? This paper is not intended to discuss this question, at least not directly. It addresses, rather, the prior issue of what can reasonably be *meant* by the assertion that some, or all, of the mentioned ontological items are vague. Without loss of generality, the present analysis will be restricted to the case of objects and first-order properties and relations.[6]

Much of the confusion surrounding the issue of ontic vagueness stems from a widespread carelessness to distinguish clearly vagueness of *objects* from vagueness of *properties*. When a property is predicated of an object and the resulting statement is vague – i.e. indefinite in truth-value –, this vagueness may *prima facie* be either "due" to the object or to the property (leaving aside, as it will always be in this paper, the trivial possibility of semantic, or epistemic indefiniteness). But an immediate objection may be raised to this way of putting the issue: how could we discuss objects (vague or otherwise) abstracting from their properties? This seems too metaphysical, even to those of us who no longer are frightened by the positivistic legacy. Of course objects cannot be fruitfully discussed in isolation from at least *some* of their properties. I believe, however, that this general metaphysical and epistemological problem will not hinder the analysis of the specific issue of how to characterize a vague object.

Let us begin by quoting two definitions of ontic vagueness that are totally blind to the distinction between vague objects and vague properties:

> *There is vagueness of this variety [metaphysical] if, for some object and some property, there is no determinate fact of the matter whether that object exemplifies that property. (Merricks, 2001, p. 145)*
> *An object a is vague iff it is indeterminate with respect to some property F: it is neither F nor nonF. (Zemach, 1991, p, 323)*

Other authors have made a step towards making the characterization more precise, by defining vague objects in terms of vague properties (a move that will be criticized below):

> *Those [...] who defend ontic or metaphysical vagueness usually take a vague object as an object whose physical properties are blurred or indeterminate. Another way of expressing this point is to say that a vague object is an object whose properties are not – as a matter of fact – all precisely specifiable or definable. (Chibeni, 2004b, p. 29)*
> *A vague object, then, can be regarded as one which has imprecise properties [...] (French and Krause, 2003, p. 97)*

But perhaps the most common view is that a vague object is an object whose *spatio-temporal* borders are blurred:

[4] See Williamson (1994) for a thorough defence of the epistemic interpretation.
[5] A useful clarification of the distinction between ontic and metaphysical vagueness can be found in footnote 1 of López de Sa (2014). Although I will not insist here on such a distinction, my focus is on ontic vagueness.
[6] For the sake of simplicity, 'properties' will be taken here as referring also to relations.

> *Then I shall classify a concrete object o as vague (in the ordinary sense in which Everest is vague) if, and only if, (a) o has borderline spatio-temporal parts and (b) there is no determinate fact of the matter about whether there are objects that are neither parts, borderline parts, or non-parts of o. (Tye, 1990, pp. 535-6)*[7]

The following, similar view, emphasises the vagueness of the part-of relation, without explicit reference to the spatio-temporal properties of the object:

> *[O]rdinary objects are vague because there is sometimes no saying whether one of them is part of another. (Morreau, 2002, pp. 333-4)*

A different account has it that ontic vagueness stems from another particular relation, namely, the *identity* relation. Much of the contemporary discussion on this account hinges on Evans's already mentioned controversial one-page result against ontic vagueness (Evans, 1978). Unfortunately, Evans has not explicitly worked out the import of this result to the issue of ontic vagueness. On the most popular reading, in order to bridge the gap from the linguistic to the ontological level Evans implicitly presupposes what Brian Garrett called the *Identity Criterion*:

> *[P]rovided that there are precise singular terms in a language of sufficient expressive power, there are vague objects iff there are identity statements – containing only precise singular terms – which are indeterminate in truth-value due to vagueness. (Garrett, 1991, p 349)*

Thus, the proposed link between vague identity and ontic vagueness in general is double. In one direction, the existence of a vague identity is taken as a sufficient condition for the existence of vague objects. This is *prima facie* plausible, given that being vague in respect of identity appears to be just a special way in which an object could be vague.[8] In the other direction, that condition is taken as also necessary for the existence of vague objects. Notice now that it is this implication that matters for Evans's main goal: to show that there can be no vague objects *in general*. It is puzzling that Evans assumed, without any justification, this rather controversial implication. But while some authors (e.g. Keefe and Smith, 1997a, Garrett, 1988, Sainsbury, 1995) attempted to devise arguments in Evans's behalf, others claimed that the arguments are flawed, or can in some way be circumvented (e.g. Williamson, 1995, Sainsbury, 1989, Heck, 1998, Barnes and Williams, 2009). Without going into details, the latter philosophers appear to be right: as Sainsbury remarks, "not all forms of vagueness in objects have any special connection with vagueness in identity" (1989, p. 101).

Although the other criteria for vague objects mentioned above are not as clearly associated to a specific no-go result as Garrett's Identity Criterion,[9] they too may, inadvertently or not, introduce a bias against the possibility of ontic vagueness. Take, for instance, the case of spatio-temporal vagueness. Perhaps the popularity of this account stems from the fact that when, as laymen, we think of a vague object, the image most likely to occur to us is that of an object whose *spatial* properties are fuzzy. Clouds and mountains, for instance, do not seem to have a precise shape or size or position. *Temporal* properties are also part of this unsophisticated notion of a vague object. We ordinarily do not take Bertrand Russell, for instance, as having precise beginning and end of existence.

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[7] In fairness, it should be mentioned that although this is Tye's formal definition, he concedes, in a footnote appended to the quoted sentences, that if there can be non-spatial concrete objects "this account will need to be revised". Unfortunately, he does not develop this important issue. For an example of a more resolute commitment to spatio-temporal properties as the root of ontic vagueness, see Rolf (1980); Heller (1996) also seems to ground his arguments against ontic vagueness entirely on such a particular view.

[8] But even this natural implication has been questioned in the literature; Garrett himself does not accept it.

[9] Notice, however, that Sorensen's (1998) detailed argument against vague objects depends crucially on defining ontic vagueness in terms of spatial properties. See Markosian (2000) for a reply.

As it happens, however, this kind of vagueness is easily dismissible as merely *superficial* vagueness, especially if the scientific background for the understanding of physical objects is provided by theories of classical physics.[10] To block this way out, we may either update our scientific presuppositions, or enlarge the scope of the notion of vague object, to include properties other than spatio-temporal properties. The first alternative has been explored by me elsewhere.[11] Here I shall inquiry into the possibility of following the latter route.

When we attempt to broaden the notion of vague object, to include properties such as hotness, hardness or colour, an immediate difficulty arises, as Keefe and Smith pointed out (1997a, p. 50, footnote 47): are we really prepared to admit that an object is vague just because its *colour* is borderline red? This is rather counter-intuitive. The most natural stand would be to regard the object's colour as being, in itself, entirely precise, and to take the vagueness of the assertion that it is red as having its root in the un-sharp meaning of the *word* 'red' (or in the partial fuzziness of the *concept* of redness). It is easy to see that a similar puzzlement arises with many, or perhaps most, of the usual properties that common sense attributes to ordinary objects.

To face this difficulty, we could backtrack, and try to restrict again the notion of vague object, by identifying a class of "privileged" properties, arguably more appropriate to characterize ontic vagueness. The idea seems attractive, but which exactly would such properties be? Before considering a promising proposal, I will briefly examine a well-known analysis of ontic vagueness by Mark Sainsbury (1989). He attempted to distinguish and formulate carefully several kinds of ontic vagueness: compositional, modal, temporal and individuative. Sainsbury's approach allows the subsumption of all these kinds of vagueness under a same formal pattern. The author does not explicitly enunciate this pattern, but it can easily be abstracted from the inspection of a couple of cases offered by him. Take, for instance, compositional and temporal vagueness:[12]

(*CV*) *x* is compositionally vague $=_{df}$ [*x*] for some object *y*, ∇ Part-of (*y*, *x*);

(*TV*) *x* is temporally vague $=_{df}$ [*x*] for some time *y*, ∇ Exists-at (*y*, *x*).

Given the openness of Sainsbury's scheme, it is worth trying to apply it to some of the paradoxical cases mentioned above. In the case of colour, for instance, it would read:

(*ColourV*) *x* is colour-vague $=_{df}$ [*x*] for some colour *C*, ∇*C x*.

The scheme formally works, but the resulting definition appears to be intuitively unacceptable.[13] Why? It is time to take stock, and to return to the suggestion made at the beginning of this article: to distinguish clearly vagueness of objects from vagueness of properties. The proposals examined thus far attempt to capture the notion of a vague object through reference to borderline cases of applicability of certain properties, but little attention is paid to the *nature* of these properties; and no justification is given for singling out the chosen properties among a wide range of candidates.[14]

Now, one can see that this is a sensitive problem by considering a difficulty pointed out by Michael Tye (1990). After proposing that a concrete, material object is vague if, and only if, it has borderline spatio-temporal parts, he considers the case of vague properties. His initial suggestion is that a prop-

[10] For the important distinction between superficial and fundamental vagueness, see Peacocke (1981), Burgess (1990), Keefe and Smith (1997a), and Hyde (1998).

[11] Chibeni (2004b). Details will not be repeated here, but the issue will be briefly resumed in the final paragraphs of this paper.

[12] Sainsbury, 1989, p. 101. The notation is standard in the literature: '[*x*]' means '*x* is such that', and ' ' means 'it is vague that'. For explicitness, I added the word 'object' to the first definition.

[13] I am here assuming, for the sake of argument, that the four cases explicitly considered by Sainsbury are unproblematic; but further inquiry may well reveal the existence of difficulties even in these cases.

[14] In his chapter on vagueness in the world, Timothy Williamson discusses the general issue of the vagueness of *universals* (1995, p. 256 ff.). In the course of his analysis, he attempts to distinguish vagueness of properties and relations themselves from vagueness of objects, *in the sense that* the objects are such that it is vague whether certain properties and relations apply to them. However, Williamson, like others, does not examine the issue of *which* properties would be germane to this task. Furthermore, his analysis is framed in terms of the epistemic interpretation, lying therefore beyond the scope of the present paper.

erty P is vague *only if* it can have borderline instances.[15] Tye immediately explains why this is not also a sufficient condition. He asks us to consider the property of being 2000 feet in height. "Intuitively this is a precise property", he adds (p. 536). But this property satisfies his condition for a vague property, since conceivably a concrete object with vague boundaries could constitute a borderline case of applicability of the property. The solution, Tye suggests, is to define vague properties with reference to *precise* objects only. Thus, the amended definition would be: P is vague if, and only if, it could have as a borderline instance a concrete object that does not have borderline spatio-temporal parts.

Although Tye's discussion hits on an important point, the specific suggestion made by him suffers from two defects. First, there is the problem that his definition of vague object arbitrarily selects spatio-temporal properties as the exclusive locus of vagueness. Secondly, while vagueness of properties is defined in terms of vagueness of objects, the latter is not altogether independent – as the case would require – of the issue of vagueness of properties. To decide whether an object has borderline spatio-temporal parts one has to know beforehand how it stands with respect to properties such as shape, size, duration, etc. But if the status of these latter in respect of vagueness or precision is not independently settled, one runs the risk of getting intuitively false borderline instances of vague properties.

Another proposal in the literature which pays due attention to the distinction between vague objects and vague properties has been presented by Bertil Rolf (1980). Rolf's technical analysis of the issue is liable, however, to similar objections. First, like Tye, Rolf also characterizes vague objects in terms of spatio-temporal properties. Secondly, Rolf's sophisticated definition of a vague property has the unwelcome consequence that precise properties can never have borderline cases! Rolf himself comments an example, without however showing any sign of dissatisfaction with it: the property of having a diameter of exactly 1.39×10^9 meters is precise "and *so* there should be no borderline cases for it" (p. 315-116), in conflict with common sense:[16] the Sun, for instance, could well be taken as a borderline case of that property. This problem renders the exact content of Rolf's definition of vague *objects* rather obscure.

A seemingly more promising approach was proposed by Elisabeth Barnes in her PhD dissertation (2007), and later developed in several papers (Barnes 2010, Barnes and Williams 2011a, 2011b). With a view to disentangle the notion of ontic vagueness from the many specific, metaphysical presuppositions often associated with it, she puts forward a minimal, "basic definitional account of ontic vagueness", running as follows:

> *(OV) Sentence S is ontically vague iff: were all representational content precisified, there is an admissible precisification of S such that according to that precisification the sentence would still be non-epistemically indeterminate in a way that is Sorites-susceptible. (Barnes, 2010, p. 604)*

Now, as Barnes herself notices, this is a purely *negative definition*, not intended "to give a reduction or analysis of ontic vagueness" (Barnes 2010, p. 604-605). By a "reductive analysis" she means one that "explains the existence of vagueness in terms of something more familiar" (p. 606). Anticipating criticism, Barnes maintains that "it is far from obvious that the ontic theorist should be expected to provide such explanations, or that her theory is impoverished if she cannot do so". Indeed, criticisms along these lines soon effectively appeared in print (Eklund, 2011), and continue to be powerfully voiced in the literature (López de Sa, 2014). Although I find these objections persuasive, I think that Barnes' account is valuable *as a starting point*, serving to distinguish the notion of ontic vagueness from other forms of vagueness (semantic, epistemic). In the second part of her 2010 paper, and also in collaboration

[15] Here and below, I omit, for brevity, the second clauses of Tye's definitions (see the above quotation), as they are not essential for the present discussion.

[16] As will be argued below, the view that precise properties cannot have borderline cases in the world is at odds also with quantum physics.

with Robert Williams (Barnes and Williams, 2011a), Barnes offers a more robust, positive *theory* of ontic vagueness. I have no space here to examine this proposal. At first look, it seems to me to be too much "classical", in the sense, for instance, of shutting down the possibility of new ontologies, such as quantum ontologies, in which ontic vagueness is something radically distinct from the "the world [leaving] it unsettled which of these [two] ways is in fact the case (so ∇p and $\nabla(\sim p)$)" (p. 611).[17]

Resuming the search for a positive, general definition of ontic vagueness, the preceding discussion seems to suggest that what is needed is an *independent* and *intuitively plausible* characterization of either vagueness of properties or of vagueness of objects (or both). In my view, Gideon Rosen and Nicholas Smith (2004) have made substantial progress in this direction. In the rest of this paper I will examine their proposal, suggesting some qualifications and complements.

A preliminary point made by the authors is that whether the world contains vague *properties* depends in part on the semantics for vague sentences. On the "fuzzy" view, a vague predicate, such as 'tall', is supposed to refer to a single property, tallness, which would accordingly be taken as vague too. On the supervaluationist view, however, 'tall' is taken as referring to an entire class of precise properties. In this case, vagueness is purely semantic; if one wished, one could eliminate or reduce it through artificial meaning delimitation. Undoubtedly, the former view is closer to common sense; but it does not, of course, constitute an inexorable philosophical argument for the existence of vague properties.

As to vague *objects*, Rosen and Smith begin by examining the view according to which an object is vague when it is a borderline case of a vague property. They reject this account, for essentially the reasons indicated above, when I considered a possible extension of Sainsbury's formula to the case of colour. As the authors remark, "not every property makes a vague object out of its borderline cases" (p. 187). Intuitively, the properties that do *not* serve this purpose are just the *vague* properties. *How, then, can this class of properties be characterized rigorously, and independently from the definition of vague objects?* This is the central issue investigated by Rosen and Smith. Their analysis is sophisticated and original, and proceeds by introducing the notion of "point property", as a rigorous version of the common sense idea of sharp property. A simplified version of the proposed criterion is the following. Properties are assumed to fall into categories (colours, shapes, sizes, etc.). It is assumed, furthermore, that for each category F there is a relation of exact similarity, $\approx$F. The expression '$P(x) = r$' is taken to mean that object x has property P to degree r, $0 \leq r \leq 1$. Now P is a *point-like* property in category F iff, for any objects x and y:

(a) If $P(x) = P(y) = 1$, then $\approx F(x, y) = 1$, and

(b) Possibly, there is an x such that $P(x) = 1$.

Finally, P is a *point property* in category F iff it is point-like and satisfies the further condition:

(c*) There is no point-like property $Q \neq P$ in F such that for x to be a degree-1 instance of P just is (in whole or in part) for it to be a degree-r instance of Q.

Vague objects are then defined in terms of point properties. The initial formulation is:

> *for an object to be intrinsically indeterminate [i.e. vague] in respect of some category [of properties] is for it to be an intermediate instance (a borderline case) of a point property in that category, and that an object is indeterminate sans phrase when it is indeterminate in respect of some category. (Rosen and Smith, 2004, p. 188-189)*

[17] For this point, see my papers indicated in the References. Going along similar line, Skow (2010) strongly criticizes Barnes' theory for failing to distinguishing "shallow" (classical) from "deep" (quantum) ontic vagueness. The relevance of quantum theory to the issue of ontic vagueness was pointed out in the pioneering works of E. J. Lowe (1994, 1997, 1999). French and Krause (1995, 1996, 2003) extend Lowe's analyses in several important directions. For a critical view of Lowe's arguments, see, for instance Noonan (1995), and also Darby (2010, 2014).

Curiously, however, a restatement of this criterion on p. 195 holds that "*x* is indeterminate in respect of F just in case *x* is not a degree-1 instance of any point property in F." (p. 195).

Notice now that the two criteria are *not* logically equivalent. It is easy to see that, at least in principle, there could be objects that are vague according to the former but sharp according to the latter. It would be incumbent on the authors to argue that this important logical asymmetry does not impair the specific analysis of ontic vagueness proposed in the article. Pending this possible development, I will take the first, broader criterion to guide the remaining of my discussion.

It is interesting now to see how the proposed criterion fares with respect to the intuitive, common sense classification of certain properties and objects as vague or sharp. Apparently, the definition of a vague property succeeds in adequately classifying as vague (non-point) properties such as red, tall and fat, which common sense takes as vague, whereas having wavelength $\lambda = 6550$ Å, being exactly 1.8 meter tall or weighing exactly 101.2 kilograms are classified as point properties. As to vague objects, the paper oddly offers no examples, except for a brief reference to a paradigmatic case, namely, clouds. But this example is analysed along the discussion of a broader (if related) topic, and as a consequence some important aspects of the analysis remained somewhat obscure.

I would suggest the following, concerning the case of clouds. Such objects are usually regarded as vague because they lack (e.g.) a precise shape. Following Rosen and Smith, we should consider here the family of shapes, constituted of an infinite number of point properties (spheres, cubes, ellipsoids, dodecahedra, etc.). Is there one such property of which a typical cloud could constitute a borderline case? This is a very perplexing question! On the one hand, the fact that the family contains infinite members renders a negative answer strictly unprovable. Thus, one could never rigorously show that a cloud is *not* a vague object. On the other hand, a putative positive answer would also raise serious difficulties. Let us suppose that we are before a cloud that at first sight looks spherical. If we examine it more closely, however, doubts may arise as to the its exact shape, because some chunks of matter neither clearly belong to the cloud nor fail to belong to it. We could then plausibly assume that the cloud is neither spherical nor non-spherical. The condition for a vague object proposed by Rosen and Smith would then be satisfied, and the cloud declared a vague object.[18]

But this verdict is not irrevocable. An obstinate opponent of ontic vagueness could retort that if we go to extremes, and consider the detailed microscopic constitution of the cloud, we would end up with a perfectly sharp array of micro-constituents, in a very complicated geometrical form, only approximately spherical. Now if we supplement this analysis by an appropriate semantic sharpening of the word 'cloud' – in terms of an exact minimum density of water vapour or something of the sort – we could perhaps decide for sure whether our cloud is spherical or not (and similarly for any other point shape property).

I submit that a similar way out is possible for the other examples of vague objects usually considered in the literature (mountains, deserts, islands, cats, heaps of sand, heads of hair, etc.), *provided* that the background physical theories implicitly evoked to supplement sensorial experience are theories of *classical* physics. This is because these *theories* involve ontologies with perfectly sharp objects and properties, *and* obey the principle of supervenience of the macro level on the micro level. Only in contemporary physics there are theories (quantum mechanics, quantum field theory) capable of blocking the way to a semantic-epistemic defence of the thesis that all physical objects are sharp. I have argued for these points in some detail elsewhere.[19] Here I just mention, omitting technical details, a simple example considered in that paper.

[18] Notice, incidentally, that if Rosen and Smith's second statement of the criterion (p. 195) for vague objects were adopted instead, the difficulties pointed out in this paragraph would be exactly reversed. This suffices to show that the two formulations are not equivalent, contrary to what the authors claim.

[19] Chibeni (2004b). For a more detailed discussion of the violation of the principle of supervenience macro-micro by quantum mechanics, see Chibeni (2004a; 2001).

According to quantum mechanics, electrons are entities such that, in *most* quantum states, they are indeterminate instances not of one, but of *all* point position properties (such as lying on the *x* axis at exactly 1.02 meter from the origin of the coordinate system). Such entities are, thus, genuinely vague in a very strong, irreducible sense.[20] Furthermore, in that article I show that certain important theoretical and experimental results in microphysics have strengthened this conclusion, by showing that *any* microphysical theory that eventually supersede quantum mechanics must (in a specific sense) incorporate the theoretical aspects leading to this fundamental kind of ontic vagueness.

Summing up, I believe that, at least for the time being, the best prospects for clarifying the rather intricate question in the title of this paper lie in the further exploration of the lines laid down by Rosen and Smith in their 2004 paper, with the qualifications and complements briefly indicated in the preceding paragraphs. One can then go on and discuss the substantial, metaphysical and scientific issue of the existence of ontic objects in the world, knowing how to properly understand this claim. Incidentally, as I argued in my papers in the Reference list, although the thesis that ordinary objects are vague are vulnerable to semantic-epistemic dismissive strategies, if this scientific framework is replaced by that of quantum physics, such dismissive strategies are seriously undermined. Room is then made for genuine ontic vagueness, at both the micro and the macro levels.

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