Quasi-objects

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Abstract

My talk contributes to the first section “Reality and Cognate Notions” by considering the concept of “quasi-object” as a citizen of the grey zone of “cognate notions”. I will argue that the theoretical objects or posits of natural science, including quantum physics, are such quasi-objects. This contrasts with the view that they are entities, which constitute our everyday life-world from the “bottom up”.

I begin by introducing the concept “quasi-object”, bringing together some of Eli Hirsch’s metaontological considerations with Jonathan Lowe’s ontological interpretation of the term (section 1). Then, in a brief excursion into the philosophy of science, I ask what sciences do when they introduce quasi-objects into their theorizing (section 2). I then return to the problem of what really exists – if not quasi-objects (section 3) – and give a brief outlook on some consequences for realism in philosophy of science and philosophical naturalism.

The main focus of my considerations is ontology and metaontology, and specifically the “objects” of natural science. The other theorems play the role of supplements and thus have a provisional and hypothetical character. In these respects, of course, my results, too, remain provisional and hypothetical.

1. What quasi-objects are

As mentioned in the summary, my introduction to the concept “quasi-object” begins with some metaontological considerations. They concern the distinction between an ontologically *proper* and ontologically *improper* way of speaking, especially in “there is/are…”-claims, as we find it in Eli Hirsch’s theory of “as if”-quantification (cf. Hirsch 2002). This is sometimes represented in the literature by differentiating between external and internal quantifiers (cf. Hofweber 2005) or heavyweight and lightweight quantifiers (cf. Chalmers 2009).

The common conviction behind this distinction, however, is that not every use of variables x, y, …, combined with a “there is/are …”-claim, automatically commits the speaker to accept the existence of the referents of the expression. Hirsch’s basic idea is that we can also speak about something *as if* it were an existing entity. This does not *solve* ontological puzzles, but it can help to “deflate” the problems behind them. A paradigmatic problem that Hirsch has in mind is the endurer/perdurer debate, which has heavily shaped the contemporary ontological scene. Are there three-dimensional diachronically

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identical things or substances, bearers of properties and changes – endurers; or are there only four-dimensional sums of numerically distinct spatio-temporal parts or phases – perdurers? According to Hirsch, as endurantists, it is not necessary to refute perdurantism as such, since we can legitimately allow there is/are-claims to run over four-dimensional objects or perdurers, as an improper or as-if-use of the quantifier ∃. As endurantists, we can speak *as if* there were perdurers, if we are prepared to give an account of the theoretical context of our liberalism.

Important for us is that the findings of quantum physics may provide such a theoretical context, since four-dimensionalism is more successful for physical modellings than any three-dimensional thing- or substance ontological frame. Quantum-physical models demand a language in which we speak about four-dimensional objects. Why should we negate that and exclude a grammar in which we speak as if there really were such perdurers?

Another as-if way of speaking in line with the results of quantum physics makes use of particular properties or fields, without determinate identity, called *tropes* (cf. Campbell 1990, chapter 6). Some who are open to the notion of tropes speak of ordinary objects, traditionally categorized as things or substances, as if they were bundles of tropes, interdependent in their existence. Hirsch would invite substance ontologists to be tolerant and to accept trope talk as legitimate as-if talk when it is helpful in some theoretical contexts.

According to Hirsch, it is not only possible but also advisable to integrate such improper ontological talk into a proper or ontologically serious way of speaking. As tolerant endurantists, we should integrate perdurer and trope talk into the grammar of an endurer language. Then we could speak – because of some theoretical constraints – as if things or substances were perdurers or even trope-bundles. We could give them names, predicate attributes of them, and even count them if we allow the introduction of alternative principles of individuation.

Here we arrive at precisely what Jonathan Lowe and others have called *quasi-objects* (cf. Lowe 1998, 58, 70ff). Quasi-objects are referents of theoretical concepts whose identity remains undetermined for principal, not contingent,

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reasons. We cannot say what the identity of quasi-objects consists in. We cannot provide identity criteria for them. Nevertheless, we can count them, which presupposes that we are able to individuate them in a reasonable way.

According to Lowe, the theoretical objects of quantum physics are the paradigmatic examples of such quasi-objects. The posits of the standard theories of quantum physics have no determinate identity, which does not prevent scientists from defining metrical orders that allow these objects to be counted. Lowe calls them “esoteric objects” in a non-pejorative sense (ibid, 58). Their acceptance is legitimate only *within* a particular theoretical context.

To allow something without determinate identity would put us ontologists in an awkward or at least difficult position if we could not find support in Hirsch’s as-if-quantification: even from the point of view that there are – in the proper sense – only entities with a determinate identity, we can allow that, for some theoretical reasons, e.g. in quantum physics, we can speak *as if* there were the aforementioned “esoteric objects”. We just have to allow ourselves to use a non-ontologically committing quantification, one that is lightweight or, for friends of Carnap, “internal”.

In short: Quasi-objects are the referents of non-ontologically committing there is/are-claims; they belong to the scope of lightweight/internal quantifiers that we can use *as if* we were speaking about real objects. Quantum-physical quasi-objects are “esoteric” in the sense that they can only be legitimately mentioned *within* or *internal to* a given theoretical context, even allowing for identifiable objects without identity.

To classify the objects of quantum physics as (perhaps not the only but a representative genus of) quasi-objects, as Lowe has suggested, presupposes not only a remarkable set of philosophical assumptions but also and chiefly a specific understanding of scientific practice. In the next section, I want to give a brief survey of this view of scientific practice.

2. What sciences do

The most relevant aspect of the presupposed understanding of scientific practice is that it is a methodological interpretation of empirical data; and that

for this interpretation it is significant to apply *models*. Crucial for our context is that such interpretations, and the choice of models, do not allow any decision to be made about what there is, or what exists. Scientific theories bring empirical data into a systematic order, but they do not explain reality. (I think this is also the core idea of 6.341 in Wittgenstein's *Tractatus*.)

How can we make this a little more plausible? Without claiming to have any detailed knowledge of atomic physics, it is clear that scientists do not come to their theories by simply picturing some (putative) objects. Their talk of atoms or subatomic particles is the result of an interpretation of empirical data, in which models obviously play an important role. Take for example the planetary model of atoms, according to which some electrons orbit around a nucleus composed of neutral and positively charged particles. This model has important theoretical advantages. As we all learnt at school, it helps us to get along with some specific experimental data, such as Rutherford's scattering. But the acceptance of the model, and this is the crucial point, does not commit us to the strange assumption that at a certain level of the micro-world, there are actually some entities moving around, just like the planets of our solar system. The same can be said in respect of models in quantum physics, as some theories mention waves or a wave/particle dualism. These are theoretically valuable models that interpret empirical data.

I follow those experts in the philosophy of science who do not see the aim of scientific theories as providing a description or elaboration of a picture of reality (see e.g. Drieschner 2021, 78 "Was man von der Quantentheorie bekommt, ist nicht eine Beschreibung der Wirklichkeit, […]"; my translation: What one gets from quantum theory is not a description of reality). Science does not exhibit entities, nor does it allow any implication about what there is or what exists, in an ontological sense. Scientists try to provide a system of propositions from which we can infer reliable prognoses of possible measurements (cf. ibid). The main means of such a methodological systematization of propositions is the application of models.

We can also find support from authors who have dealt with the concept of models in relevant scientific contexts, including, among others, Tarja Knuuttila and Marvin Rost. They regard models as "epistemic artefacts" (see: Rost and Knuuttila 2022), tools that aim to provide theoretical explanations, and

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conditions for applying theories to empirical data, or to verify/falsify them empirically. Rost and Knuuttila also explicitly warn against simplifying picturing theories of scientific models. Models do not describe reality. They do not provide insight into the basic structure of reality. Scientists do not picture the world.

Although this is dangerous for one of the philosophical goals of this paper, anti-naturalism, we can also refer to Quine and his concept of *posits* of scientific theories. Quine's examples of posits in *Word and Object* are molecules, chemical compounds (Quine 1960, § 6, 21f). Quine does not call them "quasi-objects" but rather "extraordinary things", which are introduced relative to the requirements of a theory to bring systematic order to a complex diversity of empirical data. Posits or extraordinary things are only relevant *within* the context of the theory. It is also clear in Quine that a naive realistic picture theory, e.g. about molecules, must fail. We introduce posits, e.g. molecules, because it helps us to interpret empirical data according to some models in physical, or better *chemical*, theories. Elsewhere Quine calls his posits "convenient intermediaries" between conceptual schemes and the empirical data we obtain in scientific experiments, in order to bring them into a practicable form that allows prognoses (cf. Quine 1951, 41). This fits neatly with his remarks about extraordinary things in *Word and Object*. Posits are not real objects; rather, they correspond to models that allow a methodological interpretation of empirical data, in the most economical, simple, and consistent way. Posits are quasi-objects, in the sense introduced.

It is particularly relevant for our context that even in the philosophy of science, authors concede that, in order to achieve the explanatory goal, it may make sense to speak of, e.g. posits of models in quantum physics *as if* we had to do with real objects, to which we can attribute some properties, and which can undergo change. We can talk about "extraordinary things" (Quine) as quasi-objects, as long as we do not forget that they are only "esoteric", in Lowe's sense.

This is also the point of our excursion into the philosophy of science. If the understanding of scientific practice sketched here is correct, then the putative objects of, e.g., quantum physics are in fact posits of models that can be treated quasi as real objects. This is, to put it cautiously, compatible with some

moderate versions of scientific anti-realism, which can, of course, be criticized and questioned. But, as far as I can see, it stands in a line of good traditions, not only in analytic but also in continental philosophy. As long as the alternative, scientific realism, remains far away from final victory, we as ontologists dealing with quasi-objects can sleep well with the hypotheses about scientific practice referred to above.

3. What really exists

In order to integrate quasi-objects into an ontological scheme, we must be ready to systematically connect them with some really existent beings, not-only-quasi-beings. That raises the following question: What is it that really exists? In the language of metaontology: What are really committing existential quantifiers, external, heavyweight?

Eli Hirsch has a suggestion that I would like to take up here. He actually assumes a basic, non-as-if-meaning of the existential quantifier, in consequence of existence, a linguistic vehicle that really commits ontologically.

For those less familiar with descriptive metaphysics or ontology, beginning with Aristotle and represented by Peter Strawson (1959, introduction) in contemporary debates, this may sound a little surprising. Not so to others: It is not the idealized language of natural science but our normal conceptual scheme that covers the basic structures of reality. So, the real committing quantifier is the existence quantifier of plain English. It is our ordinary use of there is/are-propositions that commit ontologically.

But what we primarily commit ourselves to with this “master quantifier” in plain English are macroscopic, three-dimensional, diachronically identical objects, enduring things or substances. The priority of commonsensical (linguistic) practice initially leads to the acceptance of an endurer-ontology. From the perspective of metaontology, we can say that thing- or substance-existence is the proper mode of existence.

This provokes an objection: is this not an oversimplifying deduction of categorical schemes from ordinary linguistic practice? I must confess that I am not able to fully reject this objection here. Just let me express my conviction:

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No, not at all, if we are ready to develop a systematic theory of such endurers, and "endurer quantification", avoiding all kinds of oversimplification, in (meta)ontology as in semantics. (For an attempt, see Kanzian 2020)

What I can do here is to present some additional arguments in favour of the aforementioned priority thesis, derived from what I have said so far. First, on the level of metaontology: Here we can say that in fact we need a basic meaning of existence and of the existential quantifier. If we were to regard all meanings as equal, we would end up in a "weird form" (Hirsch) of quantifier variance without limits to linguistic idealism.

Then, from an ontological point of view, a first step towards an endurer-based categorical scheme: What exists must have *identity* and *individuality*, as we learn from Lowe, and others, of course: No entity without identity. Endurers, whatever they are, are in any case identical with themselves, not only diachronically but also across possible worlds. If we cannot provide reliable conditions of identity for something, it cannot be an endurer. And endurers are countable; they have stable principles of individuation. Of course, there are also other candidates of identical *and* identifiable entities, such as the properties characterizing things or substances, and the changes and events in which they are involved. These, in contrast to quasi-objects, also exist but, as can be shown, in an analogous or dependent way. Endurers are not the only existents, but the prote ousia, the primary beings.

Furthermore, a brief semantic remark in favour of the priority of the endurer language: According to Hirsch, it is the endurer language, the language with primary endurer quantification, which allows an integration of alternative linguistic forms, including propositions with there is/are-phrases running over four-dimensional perdurers. It is even possible to define truth-conditions for these semantic alternatives in the endurer language; in a systematic way, by referring to the possibility of as-if-talk about quasi-objects, as I have suggested in the previous sections. The reverse is not the case. There are no successful reconstructions of an endurer language from the basis of a perdurer language. I know this sounds like a bold claim, but I think it is defensible.

The last line of argumentation I want to mention briefly here comes from the philosophy of science, and it brings our quasi-objects in connection with the

real or non-quasi-beings, enduring things. In this context, I can offer two strategies. As to the first strategy: Real endurers are presupposed methodologically in the modelling of science, including quantum physics. For this I can refer to a reliable witness in the form of Albert Einstein, who explicitly concedes that without the idea of independently existing macro-things, which we have from our commonsensical, endurer-dominated macro-world, model-based thinking, even in quantum physics, would be impossible (cf. Einstein 1948).

The standard examples of models I mentioned earlier should also make this clear: atoms modelled as planets orbiting a star, and the talk of waves and particles in quantum theory. All these models are derived from our endurer-world. In this respect, the quasi-objects posited in these models depend on the non-quasi-objects of our commonsensical life-world, including real planets, waves, and, of course, particles. This can legitimize the assumption that our everyday life practice is fundamental relative to scientific practice; that the latter is a methodologically limited derivation of the former.

The second strategy is also a way of bringing together endurer-things and quasi-objects in a consistent ontological theory, avoiding the shortcoming that atoms, subatomic particles, and waves have no connection with reality at all. What is true is that endurers exist. But whatever endurers are, they have, as parts of our commonsensical life-world, a *material* component. This material component can be analysed in an ontological way, insofar as it plays an important role in the composition of the complex unity of things and substances. But matter can also be analysed from the perspective of various natural sciences. Then, as we have assumed, models are indispensable. We can talk about the posits of these models *as if* they were things or substances in themselves. This is the theoretical locus of our quasi-objects, which brings us back to the main topic of this talk and shows that they can be brought in systematic connection with the non-quasi-objects.

Quasi-objects are the posits of models that support the scientific interpretation of the material component of real entities.

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4. Consequences

The consequences should be not too hard to see: About the implications for the philosophy of science I have said enough. The other implication is that of anti-naturalism. This is not especially surprising, but it can be made more explicit. If it is true that the (putative) particulars of the micro-world that quantum physics presents to us are not entities but quasi-objects, then it is false that quantum physics can tell us what there is. Natural science is not an authority for explaining reality, which is what naturalistic ontologies assume. In other words, ontology is not an "a posteriori" discipline dependent on quantum physics.

If we want to interpret our world ontologically, we should be open to starting with our commonsensical life-world, with its real existing inhabitants, things or substances, and all the other entities that depend on them: the properties they possess and the events in which they participate.

This is not, of course, an attack on natural science. Scientists do an excellent job. They interpret empirical data in a methodical way, successfully in both theory and practice. This is a plaidoyer against philosophical naturalism, insofar as it misinterprets science and treats its quasi-objects as entities; it confuses reality with mere cognate notions.

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