ARE PROPERTIES PARTICULAR, UNIVERSAL, OR NEITHER?

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ABSTRACT

Are properties universal or particular? According to Universalism, properties are universals because there is a certain fundamental tie that makes properties capable of being shareable by more than one thing. On the opposing side, Particularism is the view that properties are particulars due to the existence of a fundamental tie that makes properties incapable of being shared. My aim in this paper is to critically examine the connections between the notions of the fundamental tie and universality and particularity. I argue, first, that universality and particularity can characterize a property if and only if there is a universalist or a particularist fundamental tie, and, second, that it is unclear that these should be the fundamental ties that connect ordinary and scientific properties to their respective bearers. Then I develop an alternative approach to properties and the fundamental tie, which is neutralist because it dispenses with universality and particularity as features of properties, and naturalist because it naturalizes the possession of properties by replacing metaphysical fundamental ties with a scientific one, in particular, a physical process. I show how this approach improves our understanding of properties and instantiation.

I. Introduction: The Neutralist Approach to Properties

I take for granted that there are ordinary objects such as tables and chairs, that these objects have or instantiate properties such as colors and shapes, and that they consist of molecules, atoms, and elementary particles, instantiating scientific properties like charges. The thesis of Neutralism is not a statement about the existence or fundamentality of properties, but about the categorial status of properties. This thesis concerns the debate between Particularism and Universalism surrounding the so-called “problem of universals” in contemporary analytic metaphysics. Against Particularism and Universalism, the thesis of Neutralism entails a claim about the categorial neutrality of properties. Properties, according to Neutralism, are “category-neutral,” that is, neither particular nor universal. This feature of Neutralism is due to the fact that it dispenses with particularist and universalist fundamental ties (hereafter FT or F-Ties). Neutralism is also a form of Naturalism because it solves the problem of the fundamental tie, “What is the relation between particulars and properties?,” by introducing a physical FT. Now, the naturalist FT of Neutralism does not entail Universalism or Particularism about properties, because the naturalist FT of Neutralism is neither particularist nor universalist.

The plan of this paper is as follows. First, I outline the main features of Particularism and Universalism in regard to the problem of universals and the ontological issue of the fundamental tie. For reasons of space, my
main targets here are only specific versions of what I call Aristotelian Particularism and Platonic Universalism. Second, I critically examine the strong ontological connections between the F-Ties of these two views and their categorization of properties as particulars and universals, respectively. By contrast, I argue for an alternative, neutralist and naturalist, approach, in which properties are neither particular nor universal because they are not connected to things by particularist or universalist F-Ties, and in which the FT is not provided by metaphysics, but rather by science. In the latter regard, I defend what I call “reductive emergence” as the scientific fundamental tie between things and properties, and critically examine whether alternative versions of emergence can do the job. Third, I address a potential objection that Neutralism simply raises the problem of universals again in a different respect. Finally, I show how category-neutral properties may help to improve our understanding of properties and instantiation, and I propose a solution to the problem of universals framed in terms of “category-neutral similarity.”

2. **How Things Stand to Properties? Universalism, Particularism, and Neutralism**

Consider two particulars, a and b, instantiating a certain shade of red, F, and two elementary particles, c and d, instantiating a determinate charge, E. The first issue that arises between Particularism and Universalism is whether F and E are “particular” or “universal.” Contemporary Aristotelian Particularists usually appeal to the notion of “existential dependence.” This notion is intended to support their categorization of F and E as particular properties. Particularists argue that since F and E depend upon their bearers for their existence, they cannot be transferable to other bearers. Lowe, who is no particularist, has nicely defined the idea of “existential dependence” of Aristotelian Particularism as follows:

If x is a property and y is an object possessing x, then, necessarily, x exists only if y exists. (Lowe 2009, § 1)

While Lowe is indeed no particularist, Heil has explicitly appealed to Lowe’s definition (Heil 2012, p. 33) in order to defend the non-transferable character of properties such as F and E. This means that F and E cannot inhere in more than one bearer at a time. According to modern Platonic Universalists, however, the central ontological notion at stake is that of “categorial dependence.” This notion, they argue, makes possible the categorization of properties like F and E as universals.

For our purposes, the main difference between existential and categorial dependence is that while the former expresses a kind of rigid dependence between members of the same category (two particulars), which does not allow for the shareability of properties, the latter expresses a sort of nonrigid dependency between members of different categories (one particular and one universal), which allows for the shareability of properties. Thus, F and E cannot exist wholly independently of their bearers, but might, in principle, be “in” more than one bearer at the same time.

The second issue between Particularism and Universalism centers on the nature of the fundamental tie between a, b, c, and d, on the
one hand, and $F$ and $E$, on the other. What accounts for $a$ and $c$ instantiating $F$ and charge $E$, respectively? According to Particularism, properties $F$ and $E$ are had by their respective bearers in virtue of a metaphysical tie of inherence. According to this approach, $c$ is $E$ is to be ontologically analyzed as charge $E$ inhering in electron $a$. Bearing in mind existential dependence, this means that $E$ inheres in electron $c$ if and only if $E$ cannot exist in bearers other than $c$. On the other hand, for Universalism, $F$ and $E$ are had by their bearers in virtue of a metaphysical tie of exemplification. According to this approach, the possession of charge $E$ by electron $c$ is to be understood as charge $E$ being exemplified “in” electron $c$. Bringing categorial dependence to the fore, this means that $c$ exemplifies $E$ if $E$ could be “in” more bearers than $c$. Inherence and exemplification are our paradigmatic cases of particularist and universalist F-Ties.

I think that there are strong (bi-conditional) connections between particularist F-Ties and the particularity of properties, and universalist F-Ties and the universality of properties, such that

1. **Particularist connection**: a property $F$ or $E$ is particular if and only if there is a particularist $FT$.
2. **Universalist connection**: a property $F$ or $E$ is universal if and only if there is a universalist $FT$.

Now by pointing out these two connections, I do not claim to have exhausted all possible versions of Particularist and Universalist fundamental ties and the particularity and universality of properties. However, I am here merely concerned with specific versions of Aristotelian Particularism and Platonic Universalism, in which properties are particulars and universals because they enter into inherence and exemplification relations, respectively. Neutralism then should be considered only as an alternative to these specific views. In fact, after outlining these two particular connections, my main argument for Neutralism consists in a defense of a nonmetaphysical, nonparticularist and non-universalist, $FT$. In section 5, I will discuss whether the $FT$ and properties of Neutralism are definitely nonparticular and non-universal.

I must confess that I do not know how to choose a nonmetaphysical, nonparticularist and non-universalist, $FT$ other than by demanding what Jack Smart called “scientific plausibility.” But what exactly could it mean in this context to demand scientific plausibility? The idea is that the $FT$ must not be provided by metaphysical considerations, but rather by science. If we, the ontologists, look at science and interpret it properly, then we, the ontologists, can use some scientifically plausible notions to explain the philosophical problem of how objects instantiate properties. Then how do ordinary objects and particles instantiate their properties in a scientifically plausible way? A very plausible way to answer the question is to appeal to “emergence.”

I will argue that things plausibly instantiate their properties in virtue of a fundamental tie that I call, inspired by Chalmers (2006), “reductive (or weak) emergence.” This specific notion of emergence can be understood in terms of reducibility and deducibility.

I hold that there are four scientific kinds of reductive emergence that are not reducible to each other: S-Emergence for ordinary properties such as colors; F-Emergence and I-Emergence for base properties such as negative charges among others; and L-Emergence for base interactions such as forces. Is there a base level (or domain)? My answer is in the affirmative, but the question of what counts as scientifically fundamental is always an empirical question.

S-Emergence: Ordinary property $F$ emerges in ordinary object $O$ iff $F$ is reducible to and deducible from a set $G$ of lower-level properties, and a set $R$ of lower-level interactions, of a set $S$ of elementary particles of $O$. 
**F-Emergence**: Base property \( \varphi \) emerges in elementary particle \( x \) iff \( \varphi \) is reducible to and deducible from a base set \( H \) of fluctuations of a field of \( x \).

**I-Emergence**: Base property \( \varphi \) emerges in elementary particle \( x \) iff \( \varphi \) is reducible to and deducible from a base set \( W \) of interactions of \( x \) with other particles.

**L-Emergence**: Base interaction \( \psi \) emerges in elementary particle \( x \) iff \( \psi \) is reducible to and deducible from a base set \( C \) of circumstances of \( x \).

**S-Emergence** reductively explains how a set of particles may instantiate ordinary properties, while **F-Emergence** and **I-Emergence** reductively explain how particles may instantiate their scientific properties. **L-Emergence**, on the other hand, reductively explains the emergence mechanism in the case of interactions among particles. In section 4, I will show why it will not be necessary to admit Heil’s and Chalmers’s kinds of nonreductive emergence, which they call “real emergence” and “strong emergence,” respectively.

Before leaving the definitions of **S-**, **F-**, **I-**, and **L-Emergence**, I will address a potential objection to the account of emergence I have just sketched above. For one might think that if emergence is a relation, then one should account for the emergence of emergence.

### 3. Instantiation as Physical Process

Is emergence a relation? I do not think so. Does emergence emerge? I do not think so either. Here, I want to stress that emergence is not a relation, but rather a dynamic (physical) process. Thus, the instantiation of a property (the **Fundamental Tie**) in a neutralist ontology is a physical process. What is a physical process in the present context? The four kinds of emergence are processes undergone by sets of particles or single particles described by **S-**, **F-**, **I-**, and **L-Emergence**, which give rise to base properties and relations, and ordinary properties. So, are processes relational entities? Are processes emergent entities of some sort? As soon as we put it this way, we realize that the job of emergence is not that of relating things, but rather that of **causing** things. For this reason, I shall understand emergence as a causal entailment among scientific and ordinary facts. Emergence then is a process undergone by facts rather than by particulars or particles. In this manner, the deducible character of **S-**, **F-**, **I-**, and **L-Emergence** can be better understood as follows:

**S-Emergence**: Ordinary fact \( P \) about \( F \) is deducible from scientific fact \( Q \) about set \( G \) of lower-level properties, and set \( R \) of lower-level interactions of set \( S \) of elementary particles iff \( P \) is entailed by \( Q \) in conjunction with a lawful connection about the relation between \( P \) and \( Q \).

**F-Emergence**: Scientific fact \( P \) about \( \varphi \) is deducible from scientific fact \( Q \) about base set \( H \) of fluctuations of a field of an elementary particle iff \( P \) is entailed by \( Q \) in conjunction with a lawful connection about the relation between \( P \) and \( Q \).

**I-Emergence**: Scientific fact \( P \) about \( \varphi \) is deducible from scientific fact \( Q \) about base set \( W \) of interactions of \( x \) with other particles iff \( P \) is entailed by \( Q \) in conjunction with a lawful connection about the relation between \( P \) and \( Q \).

**L-Emergence**: Scientific fact \( P \) about \( \psi \) is deducible from scientific fact \( Q \) about base set \( C \) of circumstances of an elementary particle iff \( P \) is entailed by \( Q \) in conjunction with a lawful connection about the relation between \( P \) and \( Q \).

Let’s assume, for the sake of analysis, that “F” stands for the property of being green, “R” for a set of photons acting as waves, and “G” for a set of properties of \( S \). **S-Emergence** is intended to mean that the ordinary fact that “there is a green table” can be deduced from a scientific fact about the composition of the property of being green, say, “there are such-and-such wavelengths of electromagnetic radiation,” because the former is entailed by the latter in a lawful way. Now, in the view of emergence presented here, the occurrence of properties in emergence
facts can be reductively explained in virtue of more basic or even *base emergence facts*. For instance, it is not only the case that it is possible to explain the occurrence of ordinary properties like "being-green" by appealing to *S-Emergence* facts of the form "there is a green table iff there are such-and-such wavelengths of electromagnetic radiation." It is perfectly possible to explain the occurrence of base properties such as "electromagnetic radiation" by appealing to base *F-Emergence* facts of the form "there is a wavelength of such-and-such electromagnetic radiation if and only if there is a certain fluctuation of a corresponding electromagnetic field." Also, we can explain, as we will see in our discussion of Heil in the next section, the emergence of certain special base properties of elementary particles in virtue of *I-Emergence* facts about interactions among pairs of annihilated elementary particles. Finally, to say that a particle instantiates a certain force is to say that it would behave in certain fashion under certain circumstances. So when one attributes a force to a particle, one is saying that it obeys a certain law, namely, this law: if *x* is under certain circumstances, then *x* instantiates a certain force. Consider, for instance, *Coulomb's Law*. I think that it is right to say that electromagnetic forces emerge from *Coulomb's Law*, such that: for all *x*, *x* instantiates electric force of attraction *ψ* of a certain magnitude if and only if *x* is directly proportional to the product of the magnitudes of charges and inversely proportional to the square of the distance between two point charges. At the fundamental level, it seems that certain facts about base interactions, which are regarded as facts about forces, can be explained in terms of facts about base laws.

In the next section, I will examine whether we should acknowledge the existence of two alleged kinds (or *degrees*) of nonreductive emergence, namely, Heil's real emergence and Chalmers's strong emergence.

### 4. Two Nonreductive Kinds of Emergence: Real and Strong Emergence

Heil (2012) has argued that, since ordinary objects *qua* "complexes" of elementary particles lack the unity required to be either fundamental substances or property bearers, the attempt to *genuinely* ascribe ordinary properties to sets of elementary particles is simply futile. Heil concedes that a complex of elementary particles cannot be a *single* entity, but just a plurality of entities. In his words:

> Is the tomato's being red a matter of the complex's possessing a property? Call the property in question, *R*. *R* is meant to be a property, not of *s₁*, *s₂*, or *s₃*, but of the complex comprising *s₁*, *s₂*, and *s₃*, . . . It is hard to see this complex as belonging to the right ontological category. Ascribing a property to *it*, to the complex, as opposed to the substances making up the complex, has the aura of a category mistake. (Heil 2012, p. 21)

This is because he does not include in his complexes "combinations" among fundamental substances, such as interactions. I think that if Heil included in his complexes not only elementary particles, but also their combinations, such as interactions, it would be, in principle, a scientific possibility to explain the unity of sets of elementary particles. I call these single complexes "structures." Structures, in contrast with Heil's complexes, include not only nonrelational, but also relational parts. It seems that the inclusion of interactions into the picture of complexes makes sets of elementary particles suitable for the ascription of properties. Framed in terms of our reductive *S-Emergence*, property *F* emerges from the set of such-and-such elementary particles instantiating such-and-such properties, and standing in such-and-such interaction relations to each other.

There is no doubt, according to Heil, that ordinary objects are identical to sets of elementary particles. I *partly* agree with him.
Ordinary objects, if one accepts interactions as I do, are not identical with sets of elementary particles, but rather with structured or arranged particles. These relations among particles are called “interactions” by physicists. These interactions may be chemical, electromagnetic, or also gravitational. For instance, physicists tell us that elementary particles attract and repel each other in virtue of instantiating such-and-such properties. Moreover, the properties of these elementary particles stand in certain relations to the properties of structures of particles. Colors, for example, are said to be produced from such-and-such interactions among particles. For this reason, colors are also said to be deducible from certain structures of elementary particles. Are properties of elementary physical particles also produced from interactions among elementary particles? And are the properties of these elementary physical particles also deducible? In the following passage, Heil has provided a negative answer to both questions:

Focus on the fundamental things, or what physicists currently regard as the fundamental things. Do these ever emerge? Consider an imaginary case in which a new kind of particle is produced in a collider. When an α-particle encounters a β-particle, the upshot is the annihilation of the α- and β-particles, and the creation of a new kind of particle, a χ-particle, possessing properties emergent with respect to α- and β-particles. This is genuine, for-real, honest emergence! (Heil 2012, p. 30)

According to Heil, properties of certain particles are not deducible since these cannot be reduced to properties of parts of particles. Now, is it really true that we cannot reduce Heil’s properties of particles to anything else? And, is it really true that there is no reductive explanation for property X to be instantiated by the χ-particle? If so, this leads us, according to Heil, to the admission of what he calls “real emergence,” a kind of emergence that cannot be reductively explained by scientific facts.

Let us call A, B, and X the properties of the α-, β-, and χ-particles of Heil’s experimental case. It is true, as Heil claims, that base property X cannot be reduced to base properties A and B. Now, as I see it, this does not mean that base property X cannot be reducible in other empirical senses. It would seem an epistemic possibility, given Heil’s experimental case, to define base property X, not in terms of base properties A and B, but rather in terms of base interactions between the χ-particle and the α- and β-particles. In this sense of reduction, property X is deducible from particle x, if and only if X is reducible to a set of interactions J, K, etc., of x. If this is on the right track, and the property possession of base particles is grounded in an interactive kind of emergence, then, pace Heil, for property X to be instantiated by the χ-particle, there is a scientific explanation in virtue of a relation between X and the interactions of the χ-particle.

Like Heil, Chalmers (2006, p. 247) has argued for a kind of emergence of which there is no reductive explanation. According to him, since the laws of physics of our actual world might be different in other possible worlds, there are lawful connections in our actual world that would fail to be deduced in conjunction with the physical laws of other possible worlds. As Chalmers puts it:

I think that even if consciousness is not deducible from physical facts, states of consciousness are still systematically correlated with physical states. In particular, it remains plausible that in the actual world, the state of a person’s brain determines his or her state of consciousness, in the sense that duplicating the brain state will cause the conscious state to be duplicated too. That is, consciousness still supervenes on the physical domain. But importantly, this supervenience holds only with the strength of laws of nature (in the philosophical jargon, it is natural or nomological supervenience). In our world, it seems to be a matter of law that duplicating physical states will duplicate consciousness; but in other worlds with different laws, a system physically identical to me might have no consciousness at all. This suggests that the
lawful connection between physical processes and consciousness is not itself derivable from the laws of physics but is instead a further basic law or laws of its own. (Chalmers 2006, p. 247; emphasis in the original)

Powerful as this argument for nonreductive emergence is, I think that the truth of Chalmers’s argument depends upon a specific and controversial conception of properties. For it is possible for the laws of nature to be different while the actual properties are the same if and only if properties are regarded as having contingent causal roles. On the other hand, if properties have their causal roles as a matter of necessity, then there can be no possible situation with the same properties and different laws. If properties, as I firmly believe, cannot exist in isolation of the fundamental laws of nature of our world, then, contrary to Chalmers, there could not be two worlds, actual or possible, instantiating exactly the same properties and not instantiating exactly the same physical laws. As I see it, neither the facts regarding consciousness nor the facts regarding fundamental particles prove the existence of a nonreductive sort of emergence.

5. CAN NEUTRALISM RESIST THE PROBLEM OF UNIVERSALS?

Here, I will discuss whether the FT and properties of Neutralism are really nonparticular and non-universal. But first let’s take stock.

Consider again particulars a and b instantiating the property of being red, F, and particles c and d instantiating a certain charge, E. Are F and E particular, universal, or neither? As I have attempted to show here in the context of Aristotelian Particularism and Platonic Universalism, a property is particular or universal iff there is either a particularist connection or a universalist connection, such that F (or E) is particular iff there is a particularist FT, or F (or E) is universal iff there is a universalist FT. I have defended the thesis that F (or E) might turn out to be neither particular nor universal if there is no particularist or universalist FT. Then I have argued for the replacement of particularist and universalist F-Ties with a scientific FT, namely, a physical process. Now, Aristotelian Particularism and Platonic Universalism will ask us immediately: “How do you know, for example, that S-Emergence is not a particularist or a universalist FT?” “Is it not possible to raise the issue of whether the process of emergence itself is particular or universal?”

In general, in order to find out whether S-, F-, I-, and L-Emergence are particularist or universalist F-Ties, it would be necessary, of course, to face the second question. But in this particular case, it will not be necessary to address that question. Just as in the case in which we discovered that emergence does not emerge because it is not a property or relation, but rather a physical process, we will also see in a moment that emergence cannot be particular or universal for the same reason. Why is this so? The reason is that physical processes have two features that make it hard to understand how a physical process could be nonpredicable or particular or predicable or universal. Namely, emerging is a subjectless and a predicateless physical process. In the framework of Particularism and Universalism, what does it mean for physical processes like S-, F-, I-, and L-Emergence to have these two important features? First, it means that it is unclear what the subjects of these physical processes might be. For what is the subject or particular constituent of “F emerges?” or “emerging?”? As I see it, we can safely say that the emerging of properties and interactions is a subjectless or particularless physical process. Second, it means that “emerging” cannot be a universal that is predicable of many subjects. The motivation for this is the following: If the processes of emerging lack subjects as constituents, then these processes cannot be subjects of universal predications. But if processes cannot be particular exemplifications of universals, then it seems implausible to believe that there is a universal “physical process” capable of
being exemplified by many subjects. There is, however, a neutralist and naturalist sense in which it is possible to say that properties are particular or universal if we understand these notions from a quantificational point of view. As we know, we can find out particular and general facts (laws) of emergence.\(^{17}\) So my first tentative answer to the question is to claim that emergence cannot be universal or particular because it is a physical process.

Now, Aristotelian Particularism and Platonic Universalism will again object to this move: “Even if you have a non-particularist and non-universalist FT, and even if that means that properties can be neither particular nor universal, is it not still possible to ask whether \(a\) and \(b\) instantiate the same shade of red, or whether \(c\) and \(d\) instantiate the same charge?” Leaving aside the argument from the FT for the existence of category-neutral properties that I have been using here to support Neutralism in the context of the problem of the fundamental tie, the argument from Neutralism to resist the problem of universals with respect to ordinary and scientific properties and relations is an appeal to a category-neutral notion of similarity. Similarity is the starting point of the problem of universals for Particularism and Universalism. Are \(a\) and \(b\) similar with respect to \(F\)? Are \(c\) and \(d\) similar with respect to \(E\)? Particularism and Universalism both raise and attempt to answer the same questions: “What is the ontological ground of similarity? Is it a particular entity or a universal?” Neutralism claims that similarity is the starting point, but also the end of the problem of universals. Accordingly, it is not necessary to take the hard route of providing a categorical analysis of similarity. My favored ontological route is to take such an uncategorized sort of similarity easy, as others say.\(^{18}\) In this category-neutral view of similarity, similarity claims such as \(a\) is similar to \(b\) with respect to \(F\) (or \(E\)) are free of commitment to the categorial status of \(F\) (or \(E\)).

6. Conclusion

In this paper, I have developed an alternative, neutralist approach to properties and instantiation. I have argued for four claims about the problem of universals and the problem of the FT. First, I have argued that there are strong connections in the context of Aristotelian Particularism and Platonic Universalism between particularist and universalist FT-Ties, on the one hand, and the particularity and universality of properties, on the other, such that a property is particular or universal iff there are metaphysical, particularist or universalist FT-Ties. Second, in agreement with Naturalism, I have argued that the FT is reductive (weak) emergence, which is a scientific, and nonparticularist, and non-universalist FT. Third, in agreement with Neutralism, I have defended the claim that properties are neither particular nor universal entities since the FT is neither particularist nor universalist. Lastly, in accordance with the general approach defended in this paper, I have proposed a strategy to resist the problem of universals by appealing to a category-neutral notion of similarity, which does not require the postulation of particular properties, universals, or particularist or universalist FT-Ties.

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NOTES

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1. I will use the term “instantiation” to describe property-possession in a theory-neutral way, and “inherence” and “exemplification” to describe the relation of property-possession posited specifically by Particularism and Universalism, respectively.
2. See Carnap (1956).
4. To be precise, the thesis of Neutralism is that properties are category-neutral with respect to particularity and universality.
5. For a survey of the problem of the fundamental tie, see Armstrong (1989).
6. In this paper, I shall discuss only these two positions. Heil (2012) and Martin (2008), and Grossmann (1983) and Hochberg (1988) could bear the titles of Aristotelian Particularism and Platonic Universalism, respectively.
7. For an excellent survey of positions, see Rodriguez-Pereyra (2000).
13. A relevant reason for why reductive emergence is a scientific, rather than a metaphysical, FT is that the sort of deducibility involved in the emergence of properties and interactions is precisely what is required by causal explanations. On my view, while metaphysics is in charge of describing the world, science is in charge of explaining it.
14. Do we need a different account of instantiation for structural properties? I do not think so. For a discussion of the instantiation of structural properties, see Forrest’s article in this issue of APQ.
15. Are facts about F and E more fundamental than properties F and E? I do not think so. My view is that they are equi-fundamental.
16. In this respect, I follow Sellars (1981, Lecture II), who characterizes processes as being “subjectless.” As I shall attempt to show, processes should also be characterized as being “predicateless.”
17. Can laws of nature be universal or particular given a nonparticularist and non-universalist FT? The answer seems to be simple: Laws of nature qua general facts are universal to the effect that they are universally quantified facts.

REFERENCES


