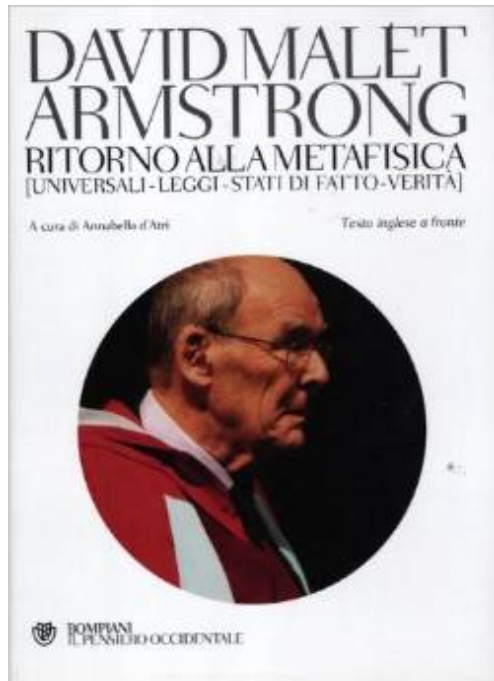


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DAVID MALET ARMSTRONG'S NEO-ARISTOTELIANISM

1. *Armstrong and Aristotle* 2. *Lowe on Aristotelian substance*
3. *Armstrong and Lowe on the Laws of nature* 4. *Conclusion*



ABSTRACT: *The aim of this paper is to establish criteria for designating the Systematic Metaphysics of Australian philosopher David Malet Armstrong as neo-Aristotelian and to distinguish this form of weak neo-Aristotelianism from other forms, specifically from John Lowe's strong neo-Aristotelianism. In order to compare the two forms, I will focus on the Aristotelian category of substance, and on the dissimilar attitudes of Armstrong and Lowe with regard to this category. Finally, I will test the impact of the two different metaphysics on the ontological explanation of Laws of nature.*

1. Armstrong and Aristotle

There are two main reasons for not considering Armstrong's Systematic Metaphysics as Aristotelian: a) the first is a "philological" reason: we don't have evidence of Armstrong reading and analyzing Aristotle's main works. On the contrary, we have evidence of Armstrong's acknowledgments to Peter Anstey¹ for drawing his attention to the reference of Aristotle's theory of truthmaker in *Categories* and to Jim Franklin² for a passage in Aristotle's *Metaphysics* on the theory of the "one"; b) the second reason is "historiographic": Armstrong isn't listed among the authors labeled as contemporary Aristotelian metaphysicians³. Nonetheless, there are also reasons for speaking of Armstrong's Aristotelianism if, according to

¹ D. M. Armstrong, *A World of State of Affairs*, Cambridge University Press, New York 1978, p. 13.

² *Ibid.*, p. 180.

³ See T. E. Tahko (edited by), *Contemporary Aristotelian Metaphysics*, Cambridge University Press, New York 2012.

Armstrong himself⁴, we don't worry about scholarship. Armstrong himself, in an earlier essay, speaks of his moderate or Aristotelian realism: «I am led to embrace a moderate or Aristotelian Realism which allows that things have properties and that two numerically different things may have the very same property»⁵.

In reality, he speaks of his own realism as Aristotelian and not of his Aristotelianism as moderate. Nevertheless, if a) his realism is Aristotelian, and b) his realism is a necessary feature of his Systematic Metaphysics⁶, then his Metaphysics is also Aristotelian.

F. Néf indeed does not hesitate to insert Armstrong's metaphysics with his "moderate realism" in an Aristotelian tradition⁷.

In fact, Armstrong is accustomed to quote Aristotle's theory in order to compare his own realism to the Transcendent or Platonic one. As a matter of fact, Armstrong's Realism, unlike Platonic realism and just like an Aristotelian one, is *immanent* and *a posteriori*. Respectively,

a) *immanent* : «I note that this version of Immanent Realism which distinguishes the particularity from the properties of a particular, while denying that the two aspects are related, constitutes the "great tradition" of Realistic thought about universals»⁸.

Furthermore, alluding without metaphor to the popular saying (in quotations marks) regarding the difference between Platonic and Aristotelian Forms as depicted in Raphael's well-known School of Athens, he writes: «we must distinguish between two sorts of

⁴ D. M. Armstrong, *Sketch for a Systematic Metaphysics*, Oxford University Press, New York 2010, p. 16.

⁵ Id., *Towards a Theory of Properties. Work in Progress on the Problem of Universals*, in «Philosophy», L, 192, 1975, p. 146.

⁶ Id., *Sketch for a Systematic Metaphysics*, cit., p. 16.

⁷ F. Néf, *Qu'est-ce que La métaphysique?*, Gallimard, Paris 2004, p. 125 and p. 128.

⁸ D. M. Armstrong, *Nominalism and Realism*, Cambridge University Press, New York, 1978, p. 109.

universals; Platonic and Aristotelian we may call them. The Platonic view makes its universals “abstracts” or heavenly objects, but an Aristotelian account, which I favor “brings them down to space-time”. [...] It is natural, I think, for an Aristotelian theory to reject uninstantiated universals»⁹.

b) *a posteriori*: «Contemporary philosophers, at least, have largely ignored the possibility of developing a theory of objective universals, where the particular universals admitted are determined on the basis of scientific rather than semantic consideration. It might perhaps be argued that [...] Aristotle and the Scholastic Realists were ahead of contemporary philosophy on this matter».¹⁰ Then with *a posteriori* Realism Armstrong means that it is a duty of scientific reasoning, which is never *a priori*, to determine what universals there are. Semantic consideration on the contrary, following Plato and most of contemporary analytic philosophers, moves from the existence of general words and arrives to identify universals with meanings¹¹.

On the *immanent* nature of universals, Armstrong speaks of the phenomenon of “the victory of particularity”: particularity taken along with universality yields particularity again¹². This phenomenon is the same noted by Aristotle who thinks that to speak of substance is primarily referring to a *this-such*; he actually thinks that the least thing capable of independent existence must be an individual (*this*) with a universal (*such*), e.g. an

⁹ Id., *Sketch for a Systematic Metaphysics*, cit., p. 16.

¹⁰ Id., *Nominalism and Realism*, cit., pp. XIV-XV.

¹¹ On that matter we can quote hermeneutical philosopher Ricoeur (see P. Ricoeur, *Being, essence and substance in Plato and Aristotle*, translated by D. Pellauer and J. Starkey, Polity Press, Cambridge, 2013) who writes that in Aristotelianism as opposite to Platonism, substance is a “subject”, a thing that exists, but at same time it is an “essence” i.e. a knowable content. Ricoeur distinguishes Aristotle’s philosophy of individual from Plato’s philosophy of meaning.

¹² D. M. Armstrong, *Nominalism and Realism*, cit., p. 115.

individual man or an individual horse¹³. About the *a posteriori* feature of his Realism, Armstrong maintains the so-called “Irish principle”: «if it can be proved *a priori* that a thing falls under a certain universal, then there is no such universal»¹⁴.

Against the transcendence of Universals Armstrong clearly makes use of the Third Man argument presented by Plato himself in *Parmenides*, but really labeled as “third man” by Aristotle in *Metaphysics*. Against the Theory of Forms Aristotle writes: «Further, of the more accurate arguments, some leads to Ideas of relations, of which we say there is no independent class, and others introduce the *third man*»¹⁵.

Armstrong as well distinguishes between two forms of regress, the *Object* regress and the *Relation* regress, which, he says, was introduced in philosophy by G. Ryle in his *Plato's Parmenides*¹⁶, but Armstrong says that such regresses are different from the *Third man*. Why? The *Third man* argument implies that there are many forms demanding at any new step a new form that has to be in common between the previous one, hence regress runs only if two conditions are realized: the self-predication and the separateness or auto-identity of the Form¹⁷, both of which Aristotle recognizes as present in Plato's Theory of Transcendent Forms. For that reason, Armstrong introduces the *restricted* argument of the *Third man*¹⁸: in many cases there are properties which don't have the property which they themselves are (for example whiteness is not white) and the simple *Third man* argument doesn't work. This is not

¹³ Aristotle, *Categories* V, 11-14, in J. L. Ackrill, *A new Aristotle Reader*, Princeton University Press, Princeton 1987, p. 7.

¹⁴ D. M. Armstrong, *A Theory of Universals*, Cambridge University Press, New York, 1978, p. 11.

¹⁵ Aristotle, *Metaph.* 990b 15, translated by W. D. Ross, in R. McKeon (ed. by) *The basic Works of Aristotle*, Random House, New York, 1941.

¹⁶ G. Ryle, *Plato's Parmenides*, in «Mind», 48 and 49, 1939-1940, and in *Collected Papers* (1971), Thoemmes Antiquarium, Bristol, 1990, pp. 1-44.

¹⁷ The two conditions are analyzed in a well-known essay on *Parmenides* (see G. Vlastos, *The Third Man Argument in the "Parmenides"*, in «Philosophical Review», 63, 1954, pp. 319-349).

¹⁸ D. M. Armstrong, *Nominalism and Realism*, cit., p. 72.

the case of the property of *being universal*; all universals indeed are of course universal, but we can stop the regress at this second level: the Form of Formhood participates only in itself. Nevertheless, that argument introduces the theme of high-order universals, which in Armstrong's system are at least necessary to explain the theory of laws of nature, considered as relations (of higher level) between universals of first level, whereas in Aristotle's system what we call "laws of nature" involve "essences" or "natures" of things.

What is very interesting is the fact that Armstrong employs the regress of the relation not only, like in Aristotle's theory, against the Transcendent Realism of Universals, but also against the Nominalism of John Locke, responsible for maintaining the existence of a substance, or *substratum*, to which properties of the individual things are related. What is that *substratum* without any particular properties we experienced? Nothing, Armstrong answers, denying the existence of a *bare* particular.

Armstrong also quotes a few of Aristotle's scholars who speak of an "Aristotelian Nominalism". According to Cresswell, «Aristotle is not ontologically committed to the existence of anything other than particulars»¹⁹ and, when he is speaking of a *species*, he speaks of the class to which the particular belongs. According to Mathews and Cohen, then in Aristotle it is possible to find a leaning towards particularism: «Greyness, like man and animal, is a classification»²⁰.

Hence, we can say, among the main theses of Aristotle, Armstrong strongly denies the thesis of existence and reality of secondary substances, because of his own acceptance of British Empiricism, although he steadily maintains the realism of universals, provided

¹⁹ M. J. Cresswell, *What is Aristotle's Theory of Universals?* in «Australasian Journal of Philosophy», 53, 3, 1975, p. 241.

²⁰ S. M. Cohen and G. R. Matthews, *The One and the Many* in «The Review of Metaphysics», 21, 4, 1968, p. 655.

that they are instantiated in particulars in order to constitute a *state of affairs*, which in Armstrong's system is the metaphysical atom. He indeed recognizes his own debt to Russell's Logical Atomism and Wittgenstein's *Tractatus*²¹.

Yet, the same Armstrong tries to rewrite the history of substance category in modern and contemporary age: he says that since in times of Locke, Berkeley and Hume, it would have been possible to make a choice between the *theory of state of affairs*, namely to maintain a theory of substance together with the realism of relations, or the refusal of substance all at once with the substance/attribute distinction:

Untransformed, and standing on its own, substance/attribute came under attack. *One* conception of substance was retained: the conception of that which is capable of independent existence. No metaphysics can reject substance in *that* sense. But the substances thus admitted were apples and suchlike. Any suggestion of a further distinction between substance and attribute *within* the apple was scorned as metaphysical rubbish²².

Armstrong argues indeed that only the state of affairs is capable of independent existence, essentially a particular together with a universal, and also that there are two kinds of universals, the monadic ones, that is to say, properties and the poliadic ones, in other words, relations.

Therefore, with regard to Aristotle's metaphysics, Armstrong thinks that it is the rejection of ontological dignity of relations that makes Aristotle's theory of substance unsuitable for contemporary scientific explanation. The main thesis of Armstrong is, just as in Aristotle's epistemology nevertheless the obvious historical differences, that metaphysics has to go together with the advancement of sciences and to be consistent with scientific theories, above all with physical theories. Here we have Armstrong's two theses: a) *Naturalism*: «the contention that the world, the totality of entities, is nothing more than the space-time system» and b) *Physicalism*: «the only particulars that

²¹ D. M. Armstrong, *A World of State of Affairs*, cit., p. 3.

²² *Ibid.*, p. 4.

the space-time system contains are physical entities governed by nothing more than the laws of physics»²³.

We can see therefore that Armstrong's criticism of Aristotle's ontology largely deals with the theory of laws of nature. That is the reason why it is very interesting (see & 3 below) to consider Armstrong's theory of laws of nature as opposed to Lowe's theory, that is quite conforming to Aristotle's tradition and is based on Aristotelian thesis of secondary substances or essences. With respect to these, *pace* Aristotle, Armstrong denies that we need to recognize «special sorts of monadic universals associated with stuff and kinds (*being gold* and *being an electron*)»; we don't need to recognize such *super-universals* because, by acceptance of principle of ontological economy or Occam' razor, we can analyze these essences in terms of «instantiated conjunctions of properties»²⁴.

However, in order to analyze such a universal as *being gold* or *being an electron* in Armstrong's system it is not sufficient to introduce the simple notion of conjunction of properties; it is also necessary to bring in the notion of "structural properties" that is, a complex property characterized by the fact that the properties they are composed of are also in certain relations amongst them.

Furthermore, Armstrong concedes that Essentialism Realism, such as the Aristotelian one, has an element of truth, namely the *Principle of Particularization*: «It is the truth that, for each particular, there exists at least one monadic universal which makes that particular just one, and not more than one, instance of a certain sort»²⁵, but Armstrong thinks that such a universal capable of particularizing could be the *spatio-temporal pattern*, the spatio-temporal position of the particular involved. Moreover,

²³ Id., *A World of State of Affairs*, cit., pp. 5-6.

²⁴ Id., *Nominalism and Realism*, cit., p. 134.

²⁵ Id., *A Theory of Universals*, cit., p. 64.

regarding the very famous kind of *being a man* or Humanity he argues that, if the universal has to be strictly identical in each instance, it is impossible to recognize that two men are precisely the same man. Each man has a particular biologic structure, that is alike and not just the same as another one. In that case Armstrong thinks that the best candidate for being essence-like is the DNA structure: but that, if this exists, it is not a unique universal, rather it will be what he says a “very complex determinable property”, which will be a structural property, where a distinct DNA structure will be the determinate property of an individual. But, for being an authentical universal in Armstrong’s system it is necessary, according to Platonic argument in *Phaedo*, to possess causal powers, that is to be the cause that explains why a thing is what it is: «The causal work in producing and maintaining a human being is surely done by constituents molecules, and more complex structure, that act in virtue of their determinate properties»²⁶.

Aristotelian essence²⁷ on the contrary seems to Armstrong to be a sort of final cause, that has the task of keeping «human being within its biological limits». Armstrong indeed is also referring to contemporary essentialism²⁸ of Ellis²⁹, who thinks that being a space-time would be considered a kind, or a substance-universal. In Ellis’s theory kind has the function of dictating the limits

²⁶ Id., *A World of State of Affairs*, cit., p. 66.

²⁷ Concerning human soul, the Italian scholar E. Berti, following Sharples (see R. W. Sharples, *Some Thoughts on Aristotelian Form: With Special Reference to “Metaphysics”?* Z 8, in «Science in Context», 18, 1, 2005, pp. 93-109), argues that Aristotle thinks that the universal soul has its essential features only potentially, whereas only the individual soul is in act. In Berti’s opinion DNA biological theory is consistent with Aristotle’s definition of human essence as individual form that during one’s life is developing capabilities of species in a unique distinguishing mode (see E. Berti, *Aristotele e la genetica contemporanea*, in «Fenomenologia e Società», 29, 2006, pp. 5-11).

²⁸ According to R. Quine, we can define essentialism as «the doctrine that some of the attributes of a thing (quite independently of the language in which the thing is referred to) may be essential to the thing and others accidental» (see W. Quine, *Three grades of Modal Involvement*, in Id., *The Ways of Paradox and Other Essays*, Random House, New York 1966. pp. 156-174).

²⁹ See B. Ellis, *Scientific Essentialism*, Cambridge University Press, New York 2001.

beyond which the causal interactions of the things cannot go. A scientific realist like Armstrong, on the contrary, has the task of recognizing universals discovered by science that is always in progress. We can say that it is the openend feature of sciences that makes Armstrong opposed to essentialism, although he recognizes that the theory of essences or secondary substances is an answer to a very important question: why does the world contain kinds of things, individual objects that are gathered into “natural classes”? Armstrong, however, analyses natural classes in terms of resemblance of universals and maintains that there are no determinable universals, but only determinable predicates and that determinate universals are linked by the relation of partial identity. In fact, as argued by Friesen in 2006³⁰, only structural and conjunctive universals can share partial identity because they have *constituent* universals. We can say in contemporary idiom that in Aristotle *secondary substance* or *essence* is a monadic universal, that is the same in all, whereas in Armstrong, being kinds reduced to resemblance classes whose members have not in common all the same complex universal, it is possible to safeguard the peculiarity of the individual and to leave the future open to new classifications.

In Armstrong’s opinion, it is truth that *species* or kinds «mark true joints in nature» but «the deepest, most absolute, of joints are given solely by property and relation universals, linked together by nomic relations» and «all the kinds of thing that there are, supervene»³¹.

Armstrong’s ontological concept of *supervenience*, also expressed by the metaphor *free lunch*, means that what supervenes it is not

³⁰ Friesen argues that Armstrong’s analysis of natural classes fails because his account is based on resemblance relation and all analyses of that kind involves circularity: resemblance is explained by the same resemblance exhibited in the outset (L. Friesen, *Natural classes of universals: why Armstrong’s analysis fails*, in «Australasian Journal of Philosophy», 84, 2, 2006, pp. 285-296, p. 286).

³¹ D. M. Armstrong, *A World of State of Affairs*, cit., pp. 67-68.

an ontological addition to his base. Following Lockean tradition that distinguishes *nominal essence* from *real essence*, Armstrong thinks that the *nominal essence*, composed by “diagnostic properties”, flows from the real essence, but he adds that there is a relation of *necessitation* between real and nominal essence: «The deeply hidden, but central, properties *nomically necessitate* that, in various standard or special circumstances, the object has the diagnostic properties»³². Therefore, if in order to be a neo-Aristotelian it would be necessary to agree with Aristotle that category of substance is ontologically fundamental and not reducible to any other category of being³³, Armstrong’s system is not classifiable as Aristotelian. Nevertheless, if we distinguish between a *strong* Aristotelianism, that accepts theory of substance and a *weak* Aristotelianism, that accepts Aristotle’s immanent realism but tries to adapt it to the results of contemporary science, we can label Armstrong realism as *weak* neo-Aristotelianism. We will now compare that with the *strong* neo-Aristotelianism of Lowe.

2. Lowe on Aristotelian substance

According to Armstrong, it is the task of science to pick up which universals there are, therefore philosophy is not entitled of giving the metaphysical foundation for science and we can say in a Hegel phrase that “philosophy comes after science”; in Lowe’s system at the opposite philosophy is charged with metaphysical foundation of science, namely with the task of stating the realm of metaphysical possibility, *before* science starts researching its actual truths: «The idea is that the realm of metaphysical possibility is a genuine one which needs to be explored, or at

³² Id., *A Theory of Universals*, cit., p. 67.

³³ See J. Hoffman, *Neo-Aristotelianism and substance*, in T. E. Tahko (edit. by), *op. cit.*, p. 146.

least assumed, before any claim to truth in actuality can be legitimated by experience»³⁴.

The business of metaphysics is that of serving the categorical *framework* to scientists. Metaphysical delimitation is then furnished by ontology and Lowe's ontology is a four-category ontology, as he argues in the well-known book of 2005, *The Four-Categories Ontology: A Metaphysical Foundation for Natural Science*. Such an ontology is freely inspired to Aristotle, who argues that there is an ontological dependence of all other categories on category of substance. The main thesis of Lowe who maintains that it is necessary to acknowledge four interconnected categories can be easily depicted by Lowe's ontological square³⁵:



Compare that with Armstrong's two-category ontology which acknowledges only two categories: a particular and a universal jointed together in a state-of-affairs that is a result of a non-mereological union. According to Lowe, universals and particulars are indeed transcategorical inasmuch as he admits two types of universals: substantial, i.e. the kinds, and not substantial,

³⁴ E. J. Lowe, *The Possibility of Metaphysics: Substance, Time and Identity* (2001), Oxford Scholarship Online, 2003, p. 7.

³⁵ E. J. Lowe, *The four-Categories Ontology: A Metaphysical Foundation for natural Science* (2005), Oxford Scholarship Online, 2006, cap. II, p. 22.

properties and relations, and two types of particulars: the objects of the common-sense and the modes, ways things are, usually called by contemporary ontology “tropes” or particular properties or relations. The relation of instantiation that for Armstrong is not a very relation and holds only between the bottom left corner of Lowe’s square and the top right corner (relation that Lowe calls of “exemplification”), according to Lowe is a relation between a universal and a particular, but Lowe admits also the relation of “characterizing”: a kind, i.e. a *species*, is characterized by a number of properties and relations, meanwhile an object of such a kind is characterized by particular properties and relations that are instances of the corresponding universal properties and relations. But why is all that ontology a real Aristotelian one? Lowe himself quotes Aristotle’s famous passage in *Categories* 1a20-1b5, where Aristotle distinguishes between *being in* and *being said of*:

Of things there are: (a) some are *said of* a subject but are not *in* any subject. For example, man is said of a subject, the individual man, but is not *in* any subject, (b) Some are *in* a subject but are *not said of* any subject. (By “in a subject” I mean what is in something, not as a part, and cannot exist separately from what it is in). For example, the individual knowledge-of-grammar is in a subject, the soul, but is not said of any subject; and the individual white is in a subject, the body (for all colour is in a body) but is not said of any subject, (c) Some are both *said of* a subject and *in* a subject. For example, knowledge is in a subject, the soul, and is also said of a subject, knowledge-of-grammar, (d) Some are neither *in* a subject nor *said of* a subject, for example the individual man or individual horse³⁶.

We can see that case (d), the Aristotelian “primary substance”, is the object in Lowe’s square, case (c) is a universal non substantial, case (b) is a particular property and case (a), the

³⁶ See in J. L. Ackril, *op. cit.*, p. 5.

Aristotelian “secondary substance” or essence is the kind, what defines, says which is what it is, for example it says of the individual man that it is a man.

Lowe agrees with Armstrong on maintaining that there are no universals non instantiated, then on criticizing Transcendent or Platonic Realism: «We can insist, thus, that there can be no *uninstantiated* universals and that particulars enjoy a kind of ontological priority over universals, just as Aristotle believed»³⁷.

Both Lowe and Armstrong do not accept the bundle’s theory with his claim that an individual substance is nothing but a bundle of properties, whereas the properties can be understood both as universals and as particulars. But it is Lowe which besides object or particular substance posits universal substance, then he has to defend his theory against theorists like Armstrong that do not countenance universal substances.

In Lowe’s argument we can see a *prima facie* incongruity: despite the fact that Lowe declares himself to be against a semantic approach to ontology, he speaks of category of kind as being more consistent with ordinary language. Lowe distinguishes between two fundamental categories of universal, one whose instances are objects and the other whose instances are modes: «This distinction is mirrored in language by the distinction between *sortal* and *adjectival* general terms—that is, between such general terms as “planet” and “flower” on the one hand and such general terms as “red” and “round” on the other»³⁸. And despite Lowe’s claim that ontology has to give to science the categorical framework, the main reason why Lowe favors such a distinction, as we now will see, is an epistemological one:

³⁷ E. J. Lowe, *The four-Categories Ontology: A Metaphysical Foundation for natural Science*, cit. p. 25.

³⁸ *Ibid.*, p. 16.

I will provide an account of the ontological status of laws which more closely reflects the syntactical structure of law-statements. For, as I have pointed out elsewhere, the standard form of law-statements in natural language is that of dispositional predications with natural kind terms in subject-position, other examples being "Gold is fusible", "Electrons are negatively charged" and "Mammals are warm-blooded"³⁹.

Which characteristic of law-statement does demand the ontological commitment to, in Aristotle's phrase, secondary substances? On that point Lowe is very unambiguous: it is the dispositional predication that points out that necessarily the subject of the law-statement, that in Lowe is always a kind-term, has to be *so and so*. In Lowe's phrase a kind is characterized by his necessary or essential properties. Therefore, for Lowe essentialism is necessary in ontology in order to explain what a law of nature is, whereas for Armstrong it is sufficient the realism of universals in order to explain what a law of nature is. So, if we want to understand for what reason unlike Armstrong Lowe has been induced to admit in his fundamental ontology the kinds, which coincide with Aristotle's essences or secondary substances, we have then to compare the two forms of Aristotelianism on this very critical question, to which Armstrong devoted his book of 1983, *What is a Law of nature?*

3. Armstrong and Lowe on the Laws of nature

Both Armstrong and Lowe disagree with Humean theory of laws of nature as uniformities in nature. Such a theory chiefly cannot resolve the problem of uniformities that are not laws, and therefore it cannot be considered an ontological explanation of what a law of nature is: uniformity is rather the manifestation of a law:

According to the "Humean" or "regularity" account of laws, a law is simply a universal generalization which quantifies over particulars—in the simplest case, something of the form "For all x , if Fx , then Gx ". Against this proposal, then, we find the objection raised that it

³⁹ *Ibid.*

fails to distinguish between lawlike and accidental generalizations, according both the same logical form⁴⁰.

Regularity or Humean theory on laws of nature is spread out criticized by Armstrong in the first part of his well-known book of 1983. Armstrong's very brief answer to the question *what is a law of nature?* is that a law is a relation between universals, whereas such a relation is a unique relation of necessitation:

Suppose it to be a law that Fs are Gs. F-ness and G-ness are taken to be universals. A certain relation, a relation of non-logical or contingent necessitation, holds between F-ness and G-ness. This state of affairs may be symbolized as "N (F,G)"⁴¹.

That formulation *entails* but it is not entailed by Humean uniformity. Due to Aristotelian realism of universals, "N (F,G)" is instantiated in the relation of necessitation holding between being F and being G of something. In Armstrong's words: «Something's being F necessitates that same something's being G, in virtue of the universals F and G»⁴². The expression *in virtue* is very important because it gives an account of the relation between two particular states of affairs. We have to say that, due to the fact that F and G are universals of first order (recall that in Armstrong's theory a universal together with a particular gives still a particular, as consequence of the principle of victory of particularity), the relation that holds between those universals is of second order, i.e. it is like a property of a property⁴³.

What is Lowe's answer to the very same question? A law of nature is some kind's possessing some property (universal):

individual objects possess their various natural "powers" in virtue of belonging to substantial kinds which are subject to appropriate laws-

⁴⁰ *Ibid.*, p. 143.

⁴¹ D. M. Armstrong, *What is a Law of nature?*, Cambridge University Press, New York, 1983, p. 85.

⁴² *Ibid.*, p. 96.

⁴³ In effect at first Armstrong thought that a state of affairs such as N (F, G) was a particular (see *ibid.*, p. 89).

these laws consisting in the possession by such kinds of certain properties (in the sense of universals), or in the standing of kinds in certain relations to one another⁴⁴.

Lowe too uses expression *in virtue* in order to explain what a law of nature consists in: it is the essential feature of the kind the single object belongs to that gives ontological foundation to causation in particular cases, that come to being or *occur*, in Lowe's phrase. For example, "common salt is water-soluble", or "water solves salt" is a dispositional predication that picks up a universal property of salt when it comes in relation with water, and when such coming in relation happens, then salt being solved occurs. If we look at Lowe's square (see figure above), an individual substance, or object, such as a piece of salt, can have the properties or attributes (universals non substantial) that characterize the kind to which it belongs or inasmuch as it instantiates the kind or inasmuch as it is characterized by the modes, that is, by the particular properties that instantiate the universal properties. In the first case, according to Lowe, predication is dispositional, in the second case, it is occurring. What are the advantage of Lowe's theory on Armstrong's theory? Lowe's answer is that we must not resort to a mysterious relation of necessitation between universals, but, we can reply, Lowe too appeals to more than one mysterious relation, to those of "characterization", "instantiation" and also of "exemplification" that holds between an object and its universal attributes⁴⁵. In order to find regularity in nature both Lowe and Armstrong maintain that laws of nature concern universals rather than

⁴⁴ E. J. Lowe, *The four-Categories Ontology: A Metaphysical Foundation for natural Science*, cit., p. 125.

⁴⁵ Regarding many questions arising from the asymmetry of those relations Heil notices: «if the relationship between attributes and the kinds they "characterize" is the same that between modes and particular objects of which their are modes, then attributes are ways kinds are. In that case, they would seem to owe their identity to the kinds they characterize. But, according to Lowe, the reverse is true: kinds depend both for their identity and for their existence on the attributes», J. Heil, *Are four categories two too many?*, in T. E. Tahko (ed. by), *op. cit.*, p. 112.

particulars and in line with Aristotelian tradition both of them maintain also that natural necessitation is not of the same kind of metaphysical necessitation neither of logical necessitation. Their common aim is to leave some contingency in our world, although they aim to save the necessity of the laws. That is to say that natural laws don't hold in every possible world, but only in our actual world, where we know only instantiated laws. The difference between Lowe's ontological framework and Armstrong's one depends indeed on the different import they assign to the question of identification of their ontological "building blocks". In Lowe's system the category of substantial universal furnishes the identification criteria for individual substances, whereas many of Armstrong's opponents argue that there are no identification criteria for his "states of affairs". Nevertheless, both agree on relevance of causal powers in order to identify properties. Lowe furthermore argues against Ellis's scientific essentialism maintaining that in other worlds it would be possible that a substance such as salt exists without having just the same properties it has in the actual world. Lowe therefore challenges essentialism but not in its entirety: he is willing to maintain that in other worlds protons, electrons, neutrons and also oxygen atoms do exist, but, providing that values of physical constants are different in different worlds, he claims that they don't have the same causal powers as in our world. Therefore, for example, in another world salt could not be soluble in water⁴⁶. That argument sounds very strange, since it would be the case that a thing is contemporary identical with another but also non identical (in reality Lowe speaks of a difference between *intra*world and *inter*world identity criteria: for example, the grains of salt are identical in our actual world but not identical with the grains of

⁴⁶ E. J. Lowe, *The four-Categories Ontology: A Metaphysical Foundation for natural Science*, cit., p. 152.

salt in other worlds); therefore, we could say that also Lowe's essentialism is not so *strong* as Ellis's because, like Armstrong, Lowe too is not willing to think essence as something which serves as a limit beyond which the causal interactions of the things cannot go⁴⁷.

We can now conversely ask what is, if it is, the advantage of Armstrong's theory on Lowe's theory. In answering that question I will follow the suggestion of Alexander Bird who wonders whether laws require kinds⁴⁸. The question is: can we analyze examples of law given by Lowe in terms of Armstrong's ontology, i.e. can we reduce kind to a cluster of properties? Lowe gives as an example the first law of Kepler, that is, planets travel in ellipses, and it is easy to reduce the law to the form "the *kind* planet is characterized by travelling in ellipse", but we can also recognize that the first law of Kepler is a particular instance of the most general Newton's law of gravitation, that put in relation masses and distances according to a constant. In Lowe's ontology we had to admit a very general kind, such as "mass having" if we would explain the law by the universal substance. On the contrary, Armstrong's explanation of laws as relations between universals is more powerful: «That is not the case that all laws can be considered as the characterization of kinds by attributes»⁴⁹.

In particular, Armstrong's theory is capable of giving an account also for functional laws, that in contemporary science are very frequent; they really are protagonists on the scientific scene: in Armstrong's phrase, «without an account of these laws the Prince of Denmark is lacking from the play»⁵⁰.

We find the first discussion of the laws of nature in Armstrong in 1978, when he clearly writes that the most frequent paradigm of a

⁴⁷ See D. M. Armstrong, *A World of State of Affairs*, cit., p. 67.

⁴⁸ See A. Bird, *Are any Kinds ontologically fundamental?*, in T. E. Tahko (ed. by), *op. cit.*, pp. 94-104.

⁴⁹ A. Bird, *op. cit.*, p. 98.

⁵⁰ D. M. Armstrong, *A World of State of Affairs*, cit., p. 241.

law is not of the form “all F are G”, but of the form of functional correlation⁵¹:

It is possible to have nomic necessities with the simple form “for all x, if x is F, then x is G” where F and G are genuine properties. An example may be the law that every electron has charge e. But what we are more likely to find is a functional correlation, or, as Mill put it, a concomitant variation, between homogeneous classes of universals. The paradigm of such a class is that “generated” by a continuously varying quantity⁵².

Therefore, it is the attention Armstrong directs on scientific issues that leads him to think laws of nature as relations between universals. However, his Aristotelian realism that does not admit universals non instantiated, has to face a difficult question: how are possible laws non instantiated or, to be more precise on our matter, how is it possible that a functional law does not hold for any value of its variables? This question will become even more pressing when Armstrong’s concern will be with truthmakers: what is there in the actual world that makes a non instantiated law

⁵¹ That is not surprising if we think that many philosophers at the beginning of the last century wondered whether the concept of substance would be adequate to the progress in science, mostly in mathematics and physics. The neo-Kantian philosopher Ernst Cassirer in 1923 asserts that, starting from mathematics, all sciences have to make use of the concept of function in place of the concept of substance: «every mathematical function represents a universal law, which, by virtue of the successive values which the variable can assume, contains within itself all the particular cases for which it holds» (E. Cassirer, *Substance and Function*, eng. transl. by W. C. Swabey, The Open Court Company, New York 1953, p. 21). Therefore, a function is defined by Cassirer just as a law that relate successive values of a variable. In Cassirer’s opinion the concept of function can give a modern answer to the old question of the one over the many, that is the question of relation between universal and particulars, the very same question faced by Armstrong ever since his earlier writings. It is noteworthy the fact that Cassirer says that on this matter he is following Russell who places more value upon relation-concept than upon thing-concept. The same opinion on Russell is expressed by Armstrong in several points: the relations have the same ontological dignity as the properties; properties are monadic universals whereas relations are polyadic universals. He writes: «We could instead speak of monadic and polyadic universals» (D. M. Armstrong, *A Theory of Universals*, cit., p. 17).

⁵² D. M. Armstrong, *A Theory of Universals*, cit., p. 129.

true? An example of such a law is the Newtonian law of inertia that holds when antecedent values go towards zero.

Armstrong treats non instantiated laws as counterfactuals, propositions that would be truth if the antecedent would be existent, which is not the case. Because of this explanation, Armstrong has now to admit in his ontology the *real* or *ontological* determinables, which at first he had rejected as if they had been generated by semantic demands: «the real determinables are genuine, and non-relational, properties of determinate properties, providing a universal to unify suitable class of determinates»⁵³. Those properties are properties of determinate properties, then they are strictly identical second-order properties: an example is just “having mass” with determinate masses as determinate properties. Therefore «functional laws of nature are relations between these determinable universals»⁵⁴. It is important to note that according to Armstrong such a determinable universal is not an addition of being, it is rather an ontological *free lunch*, that *supervenes* upon the existences of “each and every” determinate universals; it is *in* his determinate universals, just like all other universals that are *in* particulars they are instantiated by. In this manner, Armstrong thinks that also his theory concerning the laws of nature is consistent with his Aristotelian Realism.

4. Conclusion

We can say that, in compliance with Aristotelian tradition, both Lowe and Armstrong in order to explain the laws of nature are committed to universals, although necessarily instantiated in particulars, but their disagreement concerns the existence of a sort of *super-universal* beside or over others. Even though Armstrong reserves this term to the category of essence, that he himself denies, he too has to concede a sort of *super-universal* if

⁵³ Id., *A World of State of Affairs*, cit., p. 246.

⁵⁴ *Ibid.*, p. 247.

he will analyze the laws of nature as relations of second-order, therefore as universals that link together universals of first order. Such a type of universal is not “super” like in Lowe, in the sense of being fundamental and which other categories are dependent on; nevertheless, it is “super” in the sense of being over and above all other universals. Whereas Lowe makes category of kind fundamental in his ontology, Armstrong indeed analyses that category in terms of class of complex states of affairs, these last being his ontological “building blocks”, just because Armstrong aims to improve Aristotelian tradition with the outcomes of the Logical Atomism of Russell and Wittgenstein. However he also aims to correct semantic tradition awakened by Russell and Wittgenstein with Aristotelian ontological realism. That is why I have suggested to label Armstrong’s neo-Aristotelianism as *weak*, compared to Lowe’s *strong* one.

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