Darko Todorović

An Outline of an Ontology of the Toy

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For the publisher
Danijel Sinani
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Reviewers
Professor Aleksandar Loma
Professor Vojin Nedeljković
Professor Irina Deretić
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To Sandra, Olga and Sofija,
an SOS in my hour of need

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Abbreviations

Aristotle

An. Post. (= *Analytica Posteriora*)	*Posterior Analytics*
An. Pr. (= *Analytica Priora*)	*Prior Analytics*
Cael. (= *De Caelo*)	*On Heaven*
Cat. (= *Categoriae*)	*Categories*
De An. (= *De Anima*)	*On the Soul*
EE (= *Ethica Eudemea*)	*Eudemian Ethics*
EN (= *Ethica Nicomachea*)	*Nicomachean Ethics*
GA (= *De generatione animalium*)	*Generation of Animals*
GC (= *De generatione et corruptione*)	*Generation and Corruption*
HA (= *Historia animalium*)	*History of Animals*
Juv. (= *De juventute)*	*On Youth*
Mem. (= *De memoria et recollectione*)	*On Memory and Recollection*
Met. (= *Metaphysica*)	*Metaphysics*
Meteor. (= *Meteorologia*)	*Meteorology*
Mund. (= *De mundo*)	*On the Universe*
PA (= *De partibus animalium*)	*Parts of Animals*
Phys. (= *Physica*)	*Physics*
Poet. (= *Poetica*)	*Poetics*
Pol. (= *Politica*)	*Politics*
Prob. (= *Problemata*)	*Problems*
Rhet. (= *Rhetorica*)	*Rhetoric*
Top. (= *Topica*)	*Topics*

Other Ancient and Medieval Authors

Alexander of Aphrodisias

In Top. (= *In Aristotelis Topicorum libros octo commentaria*), *Commentaries on the Eight Books of Topics*

In Metaph. (= *In Aristotelis Metaphysica commentaria*), *Commentaries on the Metaphysics of Aristotle*

Ammonius

In Cat. (= *in Aristotelis Categorias commentarium*), *Commentary on the Categories of Aristotle*

Boethius

De inst. mus. (= *De institutione musica libri quinque*), *Principles of Music in Five Books*

Elias

In Cat. (= *In Aristotelis Categorias commentaria*), *Commentaries on the Categories of Aristotle*

Galen

De sem. (= *De semine*), *On Semen*

Hippocratic corpus

De vet. med. (= *De vetere medicina*), *On Ancient Medicine*

Old Stoics

SVF (= *Stoicorum veterum fragmenta*), *Fragments of Old Stoics*

Olympiodorus

In Cat. (= *In Categorias commentarium*), *Commentary on the Categories*

Philoponus

In Cat. (= *In Aristotelis Categorias commentarium*), *Commentary on the Categories of Aristotle*

Plato

Phlb. (= *Philebus*)
Phd. (= *Phaedo*)
Tht. (= *Theaetetus*)
Rep. (= *Republic*)
Epin. (= *Epinomis*)

Plutarch

Cons. Apoll. (= *Consolatio ad Apollonium*), *Letter of Condolence to Apollonius*

Porphyry

In Cat. (= *In Aristotelis Categorias commentarium*), *Commentary on the Categories of Aristotle*
Isag. (= *Isagoge*), *Introduction to Categories*

Simplicius

In Cat. (= *In Aristotelis Categorias commentarium*), *Commentary on the Categories of Aristotle*

Soranus

Gyn. (= *Gynaeciorum libri quattuor*), *Gynaecology in Four Books*

Thomas Aquinas

ST (= *Summa theologiae*)
QDV (= *Quaestiones disputatae de veritate*), *The Disputed Questions on Truth*
DEE (= *De ente et essentia*), *On Being and Essence*

Introductory Note

The aim of this study is not to shed light on the culturohistorical, social, psychological, educational or any other particular aspect of toys and games. As such, it has no historical character. On the other hand, despite the constant recourse to the writings of the *Corpus Aristotelicum*, it also has nothing to do with philosophical commentary in the usual sense (although a number of Aristotelian issues have received some sort of working interpretation—an inevitable by-product of every re-reading the Stagirite's text).

Why should we reflect on toys in an Aristotelian key? Why is this Greek thinker, rather than some other philosopher, ancient or modern, *the* exceptionally enlightening interlocutor in a dialogue on the ontology of toys? After all, Aristotle himself nowhere explicitly engages in a discussion on this particular topic (although it is hard to believe that it could have escaped his versatile and curious mind).* We will present a pair of reasons that we hope may justify our choice.

The first one is methodological. The mature forms that the basic ontological categories took in the works of their classic systematiser are recommended in themselves as practical, usable tools for the theoretical analysis at hand—in spite of their remote antiquity. The 'first philosophy' still eludes the kind of historical development and consequent obsolescence to which some other branches of the Aristotelian encyclopaedia have fallen prey.

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* Toys (παίγνια) were almost certainly among the regular points of discussion in both the Old Academy and the Lyceum (cf. e.g. Plato, *Laws* I, 644d–e and VII, 803c, with a famous simile of man as 'a plaything of the gods' that was to become one of the longest-lived topoi of European literature, see Curtius 1953, 138 = Curtius 1948, 146).

The other reason is one of principle. In a series of writings, Aristotle addresses questions concerning the ontological status of ordinary objects of natural and artificial (artisanal) origin (as e.g. in *Met*. VII 7–11). Opposite this category of beings stands, then, the artistic category, i.e. artistic artifacts in the narrow sense. Works of art—at least when it comes to that particular species of art which has a privileged status for Aristotle, and Greeks in general, and those are the products of the art of poetry—themselves constitute a very special type of beings, in many ways similar to natural ones. Hence the tragedy is, in Aristotle's own words, a 'single and entire living being' (*Poet*. 23, 1459a20), one animated by a 'soul' of its own (namely, a dramatic plot, cf. *Poet*. 6, 1450a38–39). Anyone familiar with the Aristotelian manner of thinking and expressing thoughts knows that such pronouncements cannot be mere biologistic metaphors.

The existence of a systemic dichotomy of ordinary and artistic beings (nowhere, it is true, expressly thematised, except on occasion indirectly, as e.g. in *EN* VI 4) served therefore as a fitting background conducive to highlighting the particular ontological status of a third category, virtually irreducible to either of the previous two. There is no doubt that toys, while similar in a great many ways to ordinary and artistic objects, are neither. And yet, their main specificity cannot lie in their function (toys are certainly always in service to the game, while ordinary things and works of art are not, except incidentally). The essence of their particularity is founded largely on the special ontological status they occupy among other kinds of beings. Although similar, in most cases, to objects from the category of ordinary things (both natural and man-made), toys are difficult, if not impossible, to simply confound with them. A real horse or a real house rests on an ontology that even a small child unmistakably experiences as essentially different from that of a toy horse or a doll's house. The apparent similarities cannot mislead even the most naive of users. On the other hand, an artistic representation of a horse—for instance, a small sculpture of a horse (say, a wooden figurine the size of a toy)—will exhibit the sufficiently expressive and unambiguous stamp of an artistic artifact, so excluding any possibility of confusion with a toy of similar shape, size or material (although the artwork may be intentionally used as a toy, or even receive a toylike stylisation conditioned by some artistic purpose).

To the extent that this principled distinction can be reduced to a distinction between different types of *substances*—substance is of course the central term of Aristotle's ontology—the question may be put a little more simply and with more focus: where lies the difference between the sub-

stances of the ordinary thing, the artistic thing, and the plaything? First of all, there must be, as controversial as it may appear, some indisputable similarity between them (which is already revealingly reflected in the manifest 'homonymy' of the three). But how far does this resemblance go? Without a doubt, the real horse, the sculpted horse and the toy horse have *something in common*: we recognise some shared properties in them, their substances partake of certain common features (which gives us at least the right to label them, with due caution, by one and the same denomination). Yet each is, at the same time, dramatically different from the other two. So, where, and on what criterion should we draw the borderline between them?

The examination of the ontology of toys is inseparable from the examination of the ontology of games, which is why special attention had to be paid to this issue as well. On the other hand, the analogy between a plaything and a real thing inevitably leads to a parallel analogy between the game world and the real world. The critical distinction, in our opinion, concerns the differing *expanse* of the two worlds. The real one is an open and unlimited 'ever-spreading' structure, exposed to the constant dynamics of incalculable changes that make the position of the substances involved essentially uncertain and permanently unresolved. The world of the game, by contrast (understood as a kind of simulation of the real world), constitutes a closed and steady structure, a settled 'field', a 'game board', itself included in the larger context of a 'serious' world, devoid of external boundaries. Of course, this feature is not limited to the so-called board games, defined by a set of fixed rules that make the dynamics of inherent change in principle predictable, controllable and reducible to a number of regular variations. This basic limitation and finality also characterise the free imaginative extemporisings of ordinary children's games, such as those involving puppets and micro-enactments supplied with their own dramaturgy and plot reversals (whereby each round of the game rests on a set of *ad hoc* rules and conventions that are indeed strictly valid, yet only within a single session). Unlike the unqualified and uncontrollable openness of the real world, the openness of the game world is thus in some way conditional, relative and partial, and to a certain extent subject to control, yet nevertheless capable of innumerable *kaleidoscopic alterations* within a limited set of predefined and preconcerted rules: a sort of harmless simulation of the incalculable vicissitudes of great-world affairs.

Finally, as to the closed, introverted and invariable, essentially non-ludic and non-improvisational, world of the work of art—as well as its inherent substance ('subject', 'protagonist'), the one oddly coextensive and

coalesced with its own hermetic universe ('plot', 'narrative'), and therefore stuck tight within its boundaries (like an embryo tightly packed in the mother's womb)—all this has necessarily been set aside for the time being. It is our hope that it will be the subject of its own stand-alone treatise. With that in view, the current research can also be considered a kind of preparatory study.

Belgrade, March 2021 D. T.

Sie bohrten Loch auf Loch in den Marterleib und ließen aller Enden die Kleie entströmen, welche sie sorgfältig auf einem flachen Steine zu einem Häufchen sammelten, umrührten und aufmerksam betrachteten. Das einzige Feste, was noch an der Puppe bestand, war der Kopf und mußte jetzt vorzüglich die Aufmerksamkeit der Kinder erregen; sie trennten ihn sorgfältig los von dem ausgequetschten Leichnam und guckten erstaunt in sein hohles Innere.

G. Keller, *Romeo und Julia auf dem Dorfe*

1. Preliminaries

ἐοίκασι δὲ γεννῆσαι μὲν ὅλως τὴν ποιητικὴν αἰτίαι δύο τινές, καὶ αὗται φυσικαί. τό τε γὰρ μιμεῖσθαι σύμφυτον τοῖς ἀνθρώποις ἐκ παίδων ἐστί, καὶ τούτῳ διαφέρουσι τῶν ἄλλων ζῴων ὅτι μιμητικώτατόν ἐστι καὶ τὰς μαθήσεις ποιεῖται διὰ μιμήσεως τὰς πρώτας …

(*Poet.* 4, 1448b4–8)

The brief introductory paragraph of ch. 4 of the *Poetics*, the twenty Bekker lines of which (1448b4–24) contain a kind of theoretical prologue to the historical typology of the poetic and dramatic genres of Greek literature, brings us to several of the core motifs of Aristotle's theory of mimesis. The first is highlighted in the very opening sentence of the paragraph. It concerns the identity of the 'two natural causes' that once led to the emergence of the art of poetry (ποιητικὴ τέχνη): 'It seems,' as the Stagirite puts it, 'that the art of poetry was created on the whole by certain two causes, both natural.'[1] Contrary to what we would expect in the continuation of such a programmatic claim, the philosopher (no doubt convinced that the implied dichotomy is sufficiently straightforward to the intended audience) does not supply any explicit specification of the given pair of causes. So it is up to today's reader to decide between several options suggested in the remainder of the text. Most scholars tend to favour *imitation* (τὸ μιμεῖσθαι), a notion that occupies a prominent place at the very outset of the following sentence. This nominalised infinitive is repeated once

1 All translations from Greek and Latin as well as letter-spacing emphases within quotations are the author's own. The Aristotelian quotes are based on the Bekker edition (all occasional deviations are noted).

again in the closing lines of the introductory section,[2] which probably indicates that we are dealing with some kind of technical word. In this interpretation, the role of the first of the two causes would most properly be assigned to imitation: 'For imitation is naturally inherent in humans since childhood.' The causal particle appears to reinforce the explanatory character of the second sentence, its logical reference to the focal term of the preceding statement—the keyword ποιητική. So let us cast a brief look at the logical sequence of the first and the beginning of the second sentence: 'It seems that the art of poetry was created on the whole by certain two causes, both natural. For imitation is naturally inherent in humans since childhood ...' There seems to be nothing more coherent than this train of thought. The *natural propensity to imitate* is thus the choice of Bywater, Rostagni, Montmollin, Halliwell, Janko, et al.[3] Some go a step further, not sticking to imitation as such. So, according to Lucas, it is really the 'pleasure in imitating' that should be understood as the first of the two natural causes that gave birth to the art of poetry.[4] However, such an interpretation has its own difficulties as well.[5]

1.1.1 In view of its extreme importance for man as 'the most imitative' of all other animals, mimesis—or more precisely: its human peculiarity expressed by the superlative form—takes on the character almost of a specific difference, distinguishing mankind from the rest of the animal world.[6] This is indicated in a conspicuous manner by the concluding statement of the second sentence: 'they [= men] are distinguished from other animals by

2 κατὰ φύσιν δὲ ὄντος ἡμῖν τοῦ μιμεῖσθαι, *Poet.* 4, 1448b20. It seems that the focus on the innate character of imitation (σύμφυτον ... κατὰ φύσιν), which is actually quite consistent with the main intent of the opening statement, argues for this interpretation.

3 All these scholars markedly pursue a unique formula: Bywater 1909, 125: 'imitative instinct'; Rostagni 1945, 17: 'l'istinto dell'imitazione'; Montmollin 1951, 33: 'l'instinct d'imitation'; Halliwell 1986, 70: 'instinct to engage in mimesis'; Janko 1987, 74: 'instinct for representation'.

4 Lucas 1968, 71, 74. Similarly Lord 1982, 91: 'delight in imitation'.

5 Almost the only dissonant voice is that of Else. According to him, the first cause would be 'the inborn and universal love for learning', which is admittedly one of the best-known recurring motifs of Aristotelian philosophy (its classic expression being the famous opening line of the *Metaphysics*, to which Else indeed does not fail to refer). In this view, Aristotle's claiming 'the intellectuality of both the artist and the spectator or viewer' would in fact be the philosopher's conscious reaction 'against Plato's denial of intellectuality to art' (Else 1957, 128–30).

6 τούτῳ διαφέρουσι [sc. οἱ ἄνθρωποι] τῶν ἄλλων ζῴων. The context suggests the technical (logico-ontological) use of the verb διαφέρω: τούτῳ διαφέρουσι = ταύτῃ τῇ (εἰδοποιῷ) διαφορᾷ διαφέρουσι (cf. e.g. *Phys.* IV 14, 224a7–8: τρίγωνον τριγώνου διαφορᾷ διαφέρει· τοιγαροῦν ἕτερα τρίγωνα = 'specifically different triangles').

the fact that this one[7] is the most imitative, and obtains its first instructions by imitation.'[8] Hence the superlative does not seem to be intended as a quantitative but rather a qualitative distinction: man is the μιμητικώτατον ζῷον because his imitation, unlike that performed by all other animals, has a distinctly *mathetic*, viz. learning and cognitive character.[9]

It is true that, according to Aristotle, some animals are not bereft of the ability to learn (τὸ μανθάνειν); and furthermore, the philosopher brings this into close relation with animal intelligence (τὸ φρόνιμον εἶναι),[10] a faculty he defines elsewhere (in the context of his ethical con-

7 We refer μιμητικώτατον to ζῷον; another possibility is to read it absolutely: 'something that is most imitative' (cf. *Prob.* XXX 6, 956a11–14, with the same ambiguity: διὰ τί ἀνθρώπῳ πειστέον μᾶλλον ἢ ἄλλῳ ζῴῳ; πότερον ... ὅτι ἀριθμεῖν μόνον ἐπίσταται τῶν ἄλλων ζῴων; ... ἢ ὅτι μιμητικώτατον; μανθάνειν γὰρ δύναται διὰ τοῦτο).

8 Cf. the same rendering (μάθησιν ποιεῖσθαι) in *Pol.* VIII 6, 1341a2–3 (see also Thucydides, I 68, 2). On 'modern Attic' periphrases consisting of ποιοῦμαι plus noun, see Horrocks 2010, 75.

9 τὰς μαθήσεις ποιεῖται διὰ μιμήσεως τὰς πρώτας bears a definite relationship to μιμεῖσθαι σύμφυτον ... ἐκ παίδων ἐστί (τὰς πρώτας = ἐκ παίδων); this allows the following inference: the first imitations—meaning *the imitations performed by children—are inherently mathetic* in nature. Humans are distinguished from other animals not so much by simply being the most mimetic of all, as by the specific human quality of their mimesis: it is the basic form of learning and cognition (μάθησις). See above, n. 7. It is to the μιμητικώτατον formula that Halliwell ascribes no less than the status of one of the three classic Aristotelian definitions of man (Halliwell 1986, 70–71). Cf. Belfiore 1992, 46–47.

10 *Met.* I 1, 980b22 ff. Those animals which, in addition to sense perception (αἴσθησις), common to all ζῷα, also possess *memory* (μνήμη), are, in Aristotle's view, 'more intelligent and more instructible (φρονιμώτερα καὶ μαθητικώτερα)' than those not endowed with this capacity. Memory is the necessary condition for the constitution of intelligence and ability to learn (*An. Post.* II 19, 100a3). Again, the sufficient condition for animal instructability would be the presence of a sense of hearing (ἀκοή): '[O]nly those animals are able to learn which, in addition to memory, possess this sense as well' (μανθάνει δ' ὅσα πρὸς τῇ μνήμῃ καὶ ταύτην ἔχει τὴν αἴσθησιν, *Met.* I 1, 980b24–25). Animals deprived of hearing ('like a bee and whatever other animal of the sort', 980b23–24) might actually be intelligent, but not capable of learning (980a27–b25). Such a view may surprise us, because the philosopher (apparently following the widespread belief of his contemporaries) also imagines supposed animal learning to be modelled on the human equivalent—as a process of essentially *linguistic* mediation of knowledge, whereby voices are not taken as simple acoustic signals, viz. 'noises' (ψόφοι), but as conveyors of linguistic meaning proper, viz. 'signs' (σημεῖα), that is to say, precisely as 'phonemes': 'Some animals have a certain share in both learning and teaching, some being taught by each other, others by humans as well, those, that is, participating in hearing—not only those which are able to perceive the distinctions among noises, but also distinctions among [acoustic] signs' (ἔνια [sc. ζῷα] δὲ κοινωνεῖ τινὸς ἅμα καὶ μαθήσεως καὶ διδασκαλίας, τὰ μὲν παρ' ἀλλήλων, τὰ δὲ καὶ παρὰ τῶν ἀνθρώπων, ὅσαπερ ἀκοῆς μετέχει, μὴ μόνον ὅσα τῶν ψόφων, ἀλλ'

siderations of the human φρόνησις)[11] as practical wisdom, an inborn gift of proper reasoning and decision-making about what is good or bad for the individual.[12] Therefore, he adds, many animals are called intelligent (φρόνιμα) inasmuch as they are able to take care of their own survival.[13] Nonetheless, there is a strong likelihood that both notions, intelligence and learning ability, are used 'homonymously' (ὁμωνύμως) when applied to animal nature.[14] Several reasons would favour such an inference. First of all, intelligence is essentially conditioned by science (ἐπιστήμη) and experience (ἐμπειρία), or, if not by both, then certainly by the latter.[15] Animals, on the other hand, 'have only a small share of experience',[16] and virtually none of science, their capacity for abstraction reaches at best the level of impressions (φαντασίαι), the utmost degree of notional generalisation the animal soul is capable of. As a product of retention and stabilisation of a number of individual sensations (αἰσθήσεις) of the same thing, impressions thus provide a rudimentary form of abstraction[17]—Aristotle labels it memory (μνήμη).[18] However, animal memory, deprived of the

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ὅσα καὶ τῶν σημείων διαισθάνεται τὰς διαφοράς, *HA* IX 1, 608a17–21; cf. *PA* II 17, 660a35–b1; for a kind of early intimation of a 'proto-phonology', cf. *Cat.* 6, 4b32–37; 5a33–36). The sense of hearing would therefore be a *sine qua non* of teaching and learning in all advanced animals—the basic physiological condition of any reception of linguistic instruction delivered by other animals or humans. The Middle Ages also espoused this (peripatetic?) conception, so we read in Boethius: 'No other path to the mind lies more open to the teachings than through the ears' (*Nulla enim magis ad animum disciplinis via quam auribus patet*, *De inst. mus.* I 1, 181.1–2 Friedlein).

11 *EN* VI 5.

12 αὐτὴν [= φρ.] εἶναι ἕξιν ἀληθῆ μετὰ λόγου πρακτικὴν περὶ τὰ ἀνθρώπῳ ἀγαθὰ καὶ κακά, *EN* VI 5, 1140b4–6.

13 διὸ καὶ τῶν θηρίων ἔνια φρόνιμά φασιν εἶναι, ὅσα περὶ τὸν αὑτῶν βίον ἔχοντα φαίνεται δύναμιν προνοητικήν, *EN* VI 7, 1141a26–28.

14 'Things whose name alone is common are called homonymous, yet the definition of substance corresponding to the name is different' (ὁμώνυμα λέγεται ὧν ὄνομα μόνον κοινόν, ὁ δὲ κατὰ τοὔνομα λόγος τῆς οὐσίας ἕτερος, *Cat.* 1, 1a1–2).

15 δεῖ ἄμφω ἔχειν, ἢ ταύτην [= ἐμπ.] μᾶλλον, *EN* VI 7, 1141b21–22.

16 τὰ μὲν οὖν ἄλλα [sc. ζῷα] ταῖς φαντασίαις ζῇ καὶ ταῖς μνήμαις, ἐμπειρίας δὲ μετέχει μικρόν, *Met.* I 1, 980b25–27.

17 Animal actions are largely guided by impressions, due to the nonexistence in them of mind (διὰ τὸ ἐμμένειν [sc. τὰς φαντασίας] καὶ ὁμοίας εἶναι ταῖς αἰσθήσεσι, πολλὰ κατ᾽ αὐτὰς πράττει τὰ ζῷα ... διὰ τὸ μὴ ἔχειν νοῦν, *De An.* III 3, 429a4–6). At any rate, αἰσθήσεις and φαντασίαι are not interchangeable: while the former are common to all animals, this is not the case with the latter (which are 'apparently missing in ants, bees and worms', *De An.* III 3, 428a8–11; see above, n. 10).

18 ἐκ δὲ ταύτης [sc. τῆς αἰσθήσεως] τοῖς μὲν αὐτῶν [sc. τῶν ζῴων] οὐκ ἐγγίγνεται μνήμη, τοῖς δ᾽ ἐγγίγνεται, *Met.* I 1, 980a29; cf *An. Post.* II 19, 99b36–100a3 (see above, n. 10). Cf. Plato, *Phlb.* 34a (μνήμη as σωτηρία αἰσθήσεως, 'preservation of

support of superior and more advanced mental abilities (which are lacking even in the most developed species), inevitably falls short of creating experience, a far more abstract category of cognition, extracted this time from a number of individual memories of the same thing.[19] Thus, having little or no part in experience—which is the necessary condition of intelligence, as we have seen—the animal cannot be intelligent (φρόνιμον) in the true, literal sense of the word.[20] Its intelligence is therefore supposed to be taken in a 'homonymous' sense, and such indeed is its ability to learn, as well. Hence so-called animal intelligence turns out not to be up to the task of communicating science and art (ἐπιστήμη καὶ τέχνη), two superior competencies far exceeding the primitive simplicity of the animal soul, which hardly ever manages to divorce itself from the singularity of innumerable isolated impressions (φαντασίαι) and form steady general notions of any higher order. The so-called learning ability of the animal, just like its intelligence, proves thus to be only a 'homonymous' rendering for some other, actually far more primitive type of synthetic capacity. It seems that both could be best equated with what we now call the animal *instinct* (which, despite the inadequacy or entire absence of animal experience and science, still proves to be a sufficiently expedient tool for orientation and survival).[21] In a more popular sense, animal learning by imita-

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sensation'). The noteworthy distinction between memory (μνήμη) and recollection (ἀνάμνησις), which Plato raises in the same passage of the *Philebus* (34b), appears to have been a favourite among debate topics within the precincts of the Academy. Aristotle would devote a separate psychological opuscule to it (*On Memory and Recollection*). Whereas memory would imply a simple unreflected visualisation of an image representing something from the past, recollection would entail the conscious reproduction of a memory. If the former is found in some brutes, the latter occurs solely in man (*Mem.* 2, 453a8–9; see Sorabji 1972, 40–41; Bloch 2007, 131–32).

19 γίγνεται δ' ἐκ τῆς μνήμης ἐμπειρία τοῖς ἀνθρώποις· αἱ γὰρ πολλαὶ μνῆμαι τοῦ αὐτοῦ πράγματος μιᾶς ἐμπειρίας δύναμιν ἀποτελοῦσιν, *Met.* I 1, 980b28–981a1.

20 Consequently, its so-called intelligence has no ethical bearing either, hence its activity—devoid of deliberation, weighing up options and decision-making—has no character of *moral agency* (πρᾶξις): δῆλον δὲ τῷ τὰ θηρία αἴσθησιν μὲν ἔχειν, πράξεως δὲ μὴ κοινωνεῖν, *EN* VI 1, 1139a19–20. Just as 'nondeliberative' is also the *productive agency* (ποίησις) of animals, as 'they *produce* neither by art nor after examination or deliberation' (οὔτε τέχνῃ οὔτε ζητήσαντα οὔτε βουλευσάμενα ποιεῖ, *Phys.* II 8, 199a20–21); cf. below, n. 278.

21 An example of an animal μάθησις might be fledglings' 'learning' to fly. They acquire their first lessons in this skill by mimicking older individuals of their species: however, both sides act automatically, alienated and 'absent', driven only by the external compulsion of the instinct, yet indeed obtaining the usual positive effects (see below, n. 39). Although Aristotle himself provides several instances of bird mimesis, none actually shows evidence of cognition (*HA* VIII 12, 597b23–28; IX 1, 609b16–17; IX 49, 631b9–10).

tion is generally associated with the faculty of certain species to faithfully repeat the voices and gestures observed in humans, which above all makes it possible to train them in certain skills. However, it is clear that even the most complex skills animals are able to master through this kind of imitation could hardly be termed science (ἐπιστήμη) or knowledge acquired via learning and experience in the proper sense of the word, that is to say—a result of *cognitive learning*. Animal mimesis is automatic, supported only by instinctual mechanisms and so-called conditioning.[22] In the case of man, however, imitation is the very fundamental means of learning as a planned, purposeful and consciously conducted mediation of science and art, two cognitive faculties that go far beyond animal nature.[23] This appears to be the true import of the Aristotelian superlative μιμητικώτατον, as the most distinctive trait of the human species among all other ζῷα, both 'lower' and 'higher' indiscriminately.

1.1.2 How, then, is human knowledge mediated? By teaching (διδασκαλία), on the teacher's part; by receiving teachings—learning (μάθησις)—on the part of the pupil. To the extent that he acquires his first les-

22 In this regard, there is in fact no clear-cut distinction between the mimetic gift of certain bird species and the more complicated, humanoid imitativity of the great apes (μιμώ = πίθηκος). What we see in animals is always just this or that form of *unreflected repetition*, devoid of any cognitive, epistemic dimension—the only thing that would legitimise it as an imitation in the strict, literal sense. On the other hand, even the most absent-minded repetition of a man-cub already contains—and *is*—the first germ of reflection (mimetic repetition serves no purpose other than to awaken this latent reflexivity). This again is completely missing in even the most complex forms of animal imitation.

23 'Experience seems to be almost like science and art, but actually it is through experience that science and art come to men' (καὶ δοκεῖ σχεδὸν ἐπιστήμη καὶ τέχνη ὅμοιον εἶναι καὶ ἐμπειρία, ἀποβαίνει δ' ἐπιστήμη καὶ τέχνη διὰ τῆς ἐμπειρίας τοῖς ἀνθρώποις, *Met.* I 1, 981a2–4). We may regret that our philosopher did not devote any of his many λέγεται πολλαχῶς's to such a pertinent pair of terms as ἐπιστήμη and τέχνη (for their mutual distinction, dependent on their distinct ontological competences, see *An. Post.* II 19, 100a9). In the *Metaphysics* and the *Nicomachean Ethics* he distinguishes indeed between science and other cognitive abilities (i.e. those within the realm of the ἐπιστημονικόν, *EN* VI 1, 1139a12; see VI, 3, 2–3, 1139b18–36), but not between craft and art as well: in the good old Greek fashion, his masons, doctors and sculptors all indiscriminately belong to the same guild (cf. *EN* VI 4, 3, 1140a6–10; *Met.* I 1, 981a10–12; see VII 7, 1032b1 ff.). Such ambiguity, typical of the ancient Greek and, to no insignificant extent, also responsible for the fertile polysemy of Aristotle's terminological panoply—making his technical terms suitable for so many subtle mutations, meanderings and *metabases* from one 'genus' to another—allows us after all to ascribe something of a scientific stringency to any human cognition whatsoever, not only to that of a properly epistemonic nature; and something of a higher creative vein of an artistic ποιητική to any unpretentious production of craftsmanlike τέχνη.

sons by imitation, man is oriented towards mimesis as the primary and most natural means of knowledge. Likewise, the teacher was once someone's student: so the knowledge he hands on to his pupil to imitate is that which he himself once took from his own teacher, by imitating that teacher's knowledge. What one gives to imitate, the other takes by imitation, only to relay it in turn as he once received it—a *lesson to imitate*. Hence mimesis emerges as the basic means of knowledge transmission.

Whilst teaching, the teacher imparts knowledge that is *capable of being taught* (διδακτὴ γνῶσις). After all, it should be kept in mind that not all knowledge is teachable simply due to the fact of it being knowledge in a simple unqualified sense (γνῶσις). Now the knowledge capable of being an object of teaching is solely that which is *capable of being scientifically known* (ἐπιστητὴ γνῶσις), *scientific knowledge*, or the *science* (ἐπιστήμη). At the same time, it is the only knowledge that is *capable of being learned* (μαθητὴ γνῶσις).[24] For knowledge to be a science, its object, in Aristotle's view, must be one or other of those 'things that are not capable of being otherwise' (τὰ μὴ ἐνδεχόμενα ἄλλως ἔχειν), the things, that is to say, which are necessary, therefore eternal, therefore ungenerated and imperishable.[25] Every teaching is based on the prior knowledge of *this* object; consequently, it is the sole possible object of learning (μάθησις) as well.[26] What we are dealing with here is thus ultimately the universals, the generic and specific concepts (τὰ καθόλου), also termed 'secondary substances', according to the notorious technical nomenclature of the Stagirite.[27] They are the sole

24 'Moreover, every science seems to be capable of being taught, and that which is scientifically knowable is capable of being learned' (ἔτι διδακτὴ πᾶσα ἐπιστήμη δοκεῖ εἶναι, καὶ τὸ ἐπιστητὸν μαθητόν, *EN* VI 3, 1139b25–26). '[B]ecause all of science is about that which takes place either always or usually. For how else will it either be learned or taught to another?' (ἐπιστήμη μὲν γὰρ πᾶσα ἢ τοῦ ἀεὶ ἢ τοῦ ὡς ἐπὶ τὸ πολύ. πῶς γὰρ ἢ μαθήσεται ἢ διδάξει ἄλλον; *Met.* VI 2, 1027a20–22).

25 οὗ ἁπλῶς ἔστιν ἐπιστήμη, τοῦτ' ἀδύνατον ἄλλως ἔχειν, *An. Post.* I 2, 71b15–16; πάντες γὰρ ὑπολαμβάνομεν, ὃ ἐπιστάμεθα, μὴ ἐνδέχεσθαι ἄλλως ἔχειν· τὰ δ' ἐνδεχόμενα ἄλλως, ὅταν ἔξω τοῦ θεωρεῖν γένηται, λανθάνει εἰ ἔστιν ἢ μή. ἐξ ἀνάγκης ἄρα ἐστὶ τὸ ἐπιστητόν. ἀΐδιον ἄρα· τὰ γὰρ ἐξ ἀνάγκης ὄντα ἁπλῶς πάντα ἀΐδια, τὰ δ' ἀΐδια ἀγένητα καὶ ἄφθαρτα, *EN* VI 3, 1139b19–24; ἔτι τὸ μὴ ἐνδεχόμενον ἄλλως ἔχειν ἀναγκαῖόν φαμεν οὕτως ἔχειν ... ἔτι ἡ ἀπόδειξις τῶν ἀναγκαίων, ὅτι οὐκ ἐνδέχεται ἄλλως ἔχειν, εἰ ἀποδέδεικται ἁπλῶς, *Met.* V 5, 1015a33–35, 1015b6–8.

26 πᾶσα διδασκαλία καὶ πᾶσα μάθησις διανοητικὴ ἐκ προϋπαρχούσης γίνεται γνώσεως, *An. Post.* I 1, 71a1–2; ἔτι διδακτὴ πᾶσα ἐπιστήμη δοκεῖ εἶναι, καὶ τὸ ἐπιστητὸν μαθητόν. ἐκ προγινωσκομένων δὲ πᾶσα διδασκαλία, *EN* VI 3, 1139b25–26; πᾶσα μάθησις διὰ προγιγωσκομένων, *Met.* I 9, 992b30 ff.

27 δεύτεραι δὲ οὐσίαι λέγονται, ἐν οἷς εἴδεσιν αἱ πρώτως οὐσίαι λεγόμεναι ὑπάρχουσιν, ταῦτά τε καὶ τὰ τῶν εἰδῶν τούτων γένη, *Cat.* 5, 2a14–16 (cf. 2b29 ff.). The term actually only appears in the *Categories*.

objects of knowledge capable of being logically proven and defined.[28] On the other hand, all that is 'capable of being otherwise' (τὰ ἐνδεχόμενα ἄλλως ἔχειν), and hence incapable of being known as to whether it exists or not every time it passes out of observation (θεωρία),[29] all incidental, transient and universally replaceable features of individual things (τὰ καθ' ἕκαστον), not subject to definition or proof—all this, incapable of being scientifically known (οὐκ ἐπιστητά), becomes, *eo ipso*, incapable of being taught (οὐ διδακτά) or learned (οὐ μαθητά),[30] ultimately evading imitation itself, the mimetic communication of epistemic messages between teacher and student—that continuous chain of successive handover of 'science and art'. Even though the experience (ἐμπειρία) 'seems to be almost like science and art',[31] which are generated precisely by abstraction out of the plurality of individual instances of experiencing the same thing,[32] it will still remain unknowable, and hence unteachable and unlearnable, precisely due to the fact of being *a knowledge of the individual*,[33] the one that does not account for the principles (ἀρχαί) and the causes (αἰτίαι) of things, about their διότι ('the wherefore'), being satisfied with the sheer

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28 ἡ μὲν ἄρα ἐπιστήμη ἐστὶν ἕξις ἀποδεικτική, καὶ ὅσα ἄλλα προσδιοριζόμεθα ἐν τοῖς ἀναλυτικοῖς· [= *An. Post.* I 2, 71b17 ff.] ὅταν γάρ πως πιστεύῃ καὶ γνώριμοι αὐτῷ ὦσιν αἱ ἀρχαί, ἐπίσταται, *EN* VI 3, 1139b31–34; ἡ ἐπιστήμη περὶ τῶν καθόλου ἐστὶν ὑπόληψις καὶ τῶν ἐξ ἀνάγκης ὄντων, εἰσὶ δ' ἀρχαὶ τῶν ἀποδεικτῶν καὶ πάσης ἐπιστήμης (μετὰ λόγου γὰρ ἡ ἐπιστήμη), *EN* VI 6, 1140b31–33; *Met.* III 6, 1003a14–15; VII 10, 1035a28–29; XI 1, 1059b25–26; XI 2, 1060b20; XIII 10, 1086b33; XIII 10, 1087a11; cf. also I 1, 981a16 (ἡ δὲ τέχνη τῶν καθόλου).

29 τὰ δ' ἐνδεχόμενα ἄλλως, ὅταν ἔξω τοῦ θεωρεῖν γένηται, λανθάνει εἰ ἔστιν ἢ μή, *EN* VI 3, 1139b21–22; ἀπελθόντας δ' ἐκ τῆς ἐντελεχείας οὐ δῆλον πότερόν ποτέ εἰσιν ἢ οὐκ εἰσίν,·*Met.* VII 10, 1036a6–7; ἄδηλά τε γὰρ τὰ φθειρόμενα τοῖς ἔχουσι τὴν ἐπιστήμην, ὅταν ἐκ τῆς αἰσθήσεως ἀπέλθῃ, VII 15, 1040a2–4.

30 οὐδεμία ἐστὶ περὶ αὐτὸ [= συμβεβηκός] θεωρία, *Met.* VI 2, 1026b5; ὅτι δ' ἐπιστήμη οὐκ ἔστι τοῦ συμβεβηκότος φανερόν· ἐπιστήμη μὲν γὰρ πᾶσα ἢ τοῦ ἀεὶ ἢ τοῦ ὡς ἐπὶ τὸ πολύ—πῶς γὰρ ἢ μαθήσεται ἢ διδάξει ἄλλον; VI 2, 1027a20–23; διὰ τοῦτο δὲ καὶ τῶν οὐσιῶν τῶν αἰσθητῶν τῶν καθ' ἕκαστα οὔθ' ὁρισμὸς οὔτ' ἀπόδειξίς ἐστιν, VII 15, 1039b27–29; πᾶσα ἐπιστήμη τῶν καθόλου καὶ οὐ τῶν ἐσχάτων [= τῶν καθ' ἕκαστα], XI 1, 1059b26; τῶν καθ' ἕκαστά ἐστιν ἡ φρόνησις, ἃ γίνεται γνώριμα ἐξ ἐμπειρίας, *EN* VI 8, 1142a14–15. Individual things are in(de)finite or undefined (ἄπειρα, *Top.* II 2, 109b14), and, as such, they cannot be scientifically known (*An. Post.* I 24, 86a4–6): τὰ δὲ καθ' ἕκαστα ἄπειρα, τῶν δ' ἀπείρων πῶς ἐνδέχεται λαβεῖν ἐπιστήμην; *Met.* III 4, 999a26–28; cf. II 2, 994b22–23; τὸ δὲ καθ' ἕκαστον ἄπειρον καὶ οὐκ ἐπιστητόν, *Rhet.* I 2, 1356b31–32; III 8, 1408b27–28; τὸ μὲν ἄπειρον ᾗ ἄπειρον ἄγνωστον, *Phys.* I 4, 187b7–8; cf. III 6, 25–26.

31 *Met.* I 1, 981a1–2.

32 *Met.* I 1, 981a5–7; *An. Post.* II 19, 100a6–9.

33 *Met.* I 1, 981a15 ff.; ὅλως τε σημεῖον τοῦ εἰδότος καὶ μὴ εἰδότος τὸ δύνασθαι διδάσκειν ἐστίν, καὶ διὰ τοῦτο τὴν τέχνην τῆς ἐμπειρίας ἡγούμεθα μᾶλλον ἐπιστήμην εἶναι· δύνανται γάρ, οἱ δὲ οὐ δύνανται διδάσκειν, I 1, 981b7–9.

ὅτι (the simple unreflected fact of their existence).[34] The isolation of general and necessary knowledge already begins, indeed, at the level of sensations (αἰσθήσεις), impressions (φαντασίαι) and memories (μνῆμαι),[35] only to culminate, through ever higher and more comprehensive degrees of abstraction, inherent to humankind alone,[36] in wisdom (σοφία), as the science of principles and causes taken in and of themselves.[37]

1.1.3 If therefore imitation is the first and most natural means of mediating teachable and learnable knowledge; if this could only be the knowledge of what is capable of being scientifically known, the knowledge of the general and necessary,[38] the generic and specific concepts; it follows that even the first 'lessons learned by imitation' could have had no other object than 'what could not be otherwise', the eternal, not subject to coming into existence and ceasing to exist: the universals, or the so-called secondary substances.

1.2 How, then, does a small child master the knowledge of 'what could not be otherwise', of the general and the necessary, the universals? Certainly: through imitation, which is the first and most natural means of mediating scientific knowledge (ἐπιστήμη). The truth is that children's learning does not have a discursive character, being still a far cry from a logical proof and persuasion in the usual formal sense of the term. A little child is still 'irrational', yet this irrationality is substantially different from that of animals, in which there is no trace of *potentiality (privation) of future rational thought*. And yet childish cognitions are by no means less abstract; they are furthermore *essentially abstract*, and ultimately come down to the very mental operation of abstraction. The basic function

34 οἱ μὲν τὴν αἰτίαν ἴσασιν οἱ δ' οὔ. οἱ μὲν γὰρ ἔμπειροι τὸ ὅτι μὲν ἴσασι, διότι δ' οὐκ ἴσασιν· οἱ δὲ τὸ διότι καὶ τὴν αἰτίαν γνωρίζουσιν, *Met.* I 1, 981a28–30; cf. *An. Post.* I 2, 71b30–31; I 24, 85b27; μάλιστα δ' ἐπιστητὰ τὰ πρῶτα καὶ τὰ αἴτια, *Met.* I 2, 982b2.

35 *Met.* I 1, 980a28–29; 980b26.

36 Many μνῆμαι establish one experience (ἐμπειρία, in which animals are scarcely involved), while many experiences establish one science (ἐπιστήμη): γίγνεται δ' ἐκ τῆς μνήμης ἐμπειρία τοῖς ἀνθρώποις· αἱ γὰρ πολλαὶ μνῆμαι τοῦ αὐτοῦ πράγματος μιᾶς ἐμπειρίας δύναμιν ἀποτελοῦσιν. καὶ δοκεῖ σχεδὸν ἐπιστήμῃ καὶ τέχνῃ ὅμοιον εἶναι καὶ ἐμπειρία, ἀποβαίνει δ' ἐπιστήμη καὶ τέχνη διὰ τῆς ἐμπειρίας τοῖς ἀνθρώποις, *Met.* I 1, 980b28–981a3; also *An. Post.* II 19, 100a4–9. Cf. Plato, *Phd.* 96b.

37 σοφίαν περὶ τὰ πρῶτα αἴτια καὶ τὰς ἀρχὰς ὑπολαμβάνουσι πάντες, *Met.* I 1, 981b28 ff. A detailed discussion of σοφία is in *EN* VI 7, 1141a9 ff. Yet in the *Nicomachean Ethics*, Aristotle differentiates a still higher 'epistemonic' category—νοῦς, the speculative (= philosophical) thinking, the proper science of first principles and causes, *EN* VI 12, 1143a35 ff.: so νοῦς of *EN* and σοφία of *Met.* amount to much the same.

38 ἡ ἐπιστήμη περὶ τῶν καθόλου ἐστὶν ὑπόληψις καὶ τῶν ἐξ ἀνάγκης ὄντων, *EN* VI 6, 1140b31–32.

of learning, even the earliest learning, that of the smallest children, consists precisely in abstraction and generalisation, ranging from bare sensations (αἰσθήσεις) and impressions (φαντασίαι), which are inherent to certain animals as well, up to the highest forms of notional synthesis, reserved for humans alone. This generalisation aims at eliminating all that is superfluous and non-functional within the realm of the soul and its operations, retaining only that which can conduce to the maintenance and effective psychobiological adaptation of the individual, facilitating his orientation in the ever-changing, unpredictable and incalculable circumstances of outer and inner life. Whereas animal experience seems to collapse with each repeated attempt to establish itself, like a disposable single-use scaffold to be removed after fulfilling its immediate task—never managing to endure and remain accessible to recall[39]—human experience, on the other hand, amounts to nothing but a certain and reliable inventory of persistent logical patterns, always available to adequately anticipate and obviate all the related instances of a specific problem type, ignoring individual differences as a non-substantial, incidental surfeit of psychological information.

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39 ἐμπειρίας δὲ μετέχει μικρόν [sc. τὰ ζῷα], *Met.* I 1, 980b26–27. Animals do not remember nor recognise precedents, but solve the same problems each time as if it were the first, always starting over from the beginning, always re-gaining a complete totality of experience in addressing the given issue, only to deliver this newly-gained experience to downright amnesia as soon as the problem is solved successfully. This discontinuous, punctual nature of animal experience—conditioned by the absolute forgetfulness and indocibility of the animal soul—is, though, compensated for by the unequalled agility of this experience, its inexhaustible capacity for countless instantaneous regenerations to full extent. So the sporadic enclaves of a non-reflective experiencing (always occasioned by an urgent problem) are all regularly separated by gaps of deadly oblivion. This is how the animal mind works. It seems that this more archaic and clumsier mechanism of occasional reconstructions and deconstructions of the full-scale totality of a non-reflective experience underlies what is called instinct. Like a precision mechanical device, instinct is always alerted and triggered in a timely fashion, solving the same problem in the same regular way, although it can neither truly recognise nor recollect the problem, nor keep it stored or archived in the form of experience proper, but always encounters it anew as a completely unprecedented case (just as the alarm device—e.g. walkthrough metal detector—does not recall nor actually recognise any of the instances that have activated it countless times before, although in all future cases of the same type it will continue to react as predictably and promptly as ever). An animal that acts by instinct is therefore just as smart as any smart machine, which is really empty, devoid of a self-entity and wholly delivered to the outwardness and objectivity of the outer world. Instinct is an impersonal, mechanical experience devoid of a subject: a paradoxical experience of automaton.

2. Imitating the Idea

By virtue of this early mimetic instruction, mostly administered by parents and nannies, the young trainee quickly manages to master a fairly solid stock of practical skills and strategies needed to navigate the initial stages of life. All these behavioural patterns have a distinctly *paradigmatic* character, each potentially relating to a whole variety of individual instances of the same type. Receiving the usual ration of basic knowledge and skills through the nonviolent duress of mechanical repetition (in which the disciple engages as in a kind of interesting and entertaining play) helps to avoid individual digressions and speeds up the process of maturation and socialisation. The infant will soon acquire a sufficient command of the mother tongue, whose initial rudiments are successfully grasped through the guided repetition of certain sounds related to certain things and actions.

2.1 And finally, there are also toys, those faithful companions of growing up, the exemplary μιμήματα of the widest range of ideal types of the animate and the inanimate world: the true Platonic Ideas materiated in vivid and fun images, perfectly suited to the child's imagination. As to its fundamental purpose, the toy is indeed anything but a mere distractor or a soporific, a 'rattle' or 'dummy'. On the contrary, it serves precisely to awaken and focus the attention, to encourage the intellect and accustom it to experiencing, learning and cognising. So it always pinpoints only the most general and typical features of the thing it reproduces in its own childish guise, actually omitting all that is less than absolutely germane to its definition and proper understanding. A toy always *means* (in an absolute sense), it always teaches and preaches and, like any good pedagogue,

it always asserts that its simple lesson be understood in a single simple sense, one that is directly aimed at the eye and common sense, immediately obvious, straightforward and unambiguous. As an ultimate residue of the most essential features, which are now reduced to the necessary minimum, the toy is a perfect pedagogical tool, the concretisation of a concept, the true image of a universal—the 'badge token' of a logical species.[40] Plato's 'equinity' (whose visibility was once contested by some of Plato's contemporaries) becomes thus literally visible and tangible in the instance of a toy horse: it presents only the essential, definitional constituents of the concept 'horse', the immediately recognisable 'silhouette' of the species (horse head, horse mane, horse tail, horse hooves), consequently rejecting all that is just a little less than specific, all the terms that do not belong to the definition of this animal. This iconic epitome of an abstract conceptual content—a toy horse—is, then, presented to the child in the form of a teaching μίμημα, a pedagogical device that will not allow the pupil to wander too long in an uncertain and time-consuming search on his own accord, but spare his energy and focus as soon as possible on the critical, distinguishing traits (differentiae specificae): enabling him to situate this species quickly and readily on the taxonomic pyramid of beings, so as not to confuse it in the future with any similar species or relatives belong-

40 Yet the external appearance, even the intended exemplary functioning of certain toys, sometimes do not show any noteworthy difference compared to their 'serious' counterparts from the world of adults. The toy bucket, an inevitable companion to sand games, is not only virtually indistinguishable in comparison to a real object of the same material and shape, but can fairly adequately fulfil the same function as its 'original'. So, is there finally any substantial distinction between a real plastic bucket and a toy bucket? The answer is yes without hesitation: there *is* a distinction, and a most fundamental one. If the default purpose of a real bucket is to serve as a receptacle for water and sand, then that of a toy bucket would actually be *to stand for the idea of bucket* (= 'receptacle for water and sand') and teach this idea by way of the proper handling of the bucket-like toy. Regarding the real bucket, it is not so much the general concept of the bucket as the normal practical functioning of this particular piece of equipment that is the matter of primary concern here; whereas the fact that each individual bucket instantiates the idea of bucket, turns out to be almost a kind of accidental side effect that normally goes unnoticed. With regard to the toy bucket, on the other hand, what we are dealing with here is first and foremost the *material representation of the idea*, although the possible practical applicability and usability of this symbolic object is nevertheless implied as a kind of accidental side effect: even though it is not primarily intended to serve as a concrete receptacle for water and sand, but as a material symbol of such a tool, the toy bucket can just as readily—*per accidens*—be used for this purpose exactly the same way as a real bucket (though the toy bucket is in principle smaller than the real one—a sign of adaptation to the stature of the small users, see below, n. 50).

ing to neighbouring classes.[41] The same holds true also for those utterly reduced and schematised drawings made for children and encouraged in children:[42] all those simplified, linear and two-dimensional μιμήματα of man, house, mountain, sun—since they are all in reality emblems of concepts, selections of essential features of the respective things. Therefore 'man' is nothing but 'Stickman', the most simplistic pictorial rendering of the notorious definition of man as an 'erect biped' (the Aristotelian ζῷον δίπουν); the 'house' is a square space for living, equipped with a window, doors, a triangular roof and a chimney (the last one usually augmented with a swirling stroke, the plume of smoke which indicates a human presence, the house's completion of its own 'second entelechy');[43] the 'mountain' is a crinkly piece of landform (a zigzag line); the 'sun' is a yellow disc that radiates light and warmth (a yellow circle with radial bars) and so forth. In many cases these rudimentary notions receive hardly any further substantial enrichment, and accompany us throughout adult life in the sketchy form first established during the initial weeks and months of our original schooling by imitation.

2.2 In adopting ethical principles through unconsciously mirroring the abstract patterns of 'normal' behaviour; in classifying the entire animate and inanimate world through the early manipulation of zoomorphic and other toys and toy-form drawings, the young human is entirely dependent upon certain predefined templates as well as proven means for their smooth and effective acquisition. The first acts of abstraction are therefore not carried out independently, but unfold under the watchful mentorial scrutiny of the first preceptors, who provide the little student with all manner of ready-made models of easily and conveniently predigested universals. On the one hand, they save the learner from useless wanderings and hugely accelerate the process of abstraction, since they communicate precisely those 'knowledge and skills' which constitute the essential selection of normal, correct and exemplary notions, those par-

41 This toy horse thus functionally resembles its famous cousin represented in the Saussurean bipartite diagram of the linguistic sign: taking the place of the signified, this horse-silhouette is actually an *ideogram*, an eidetic thumbnail of the respective concept, similar to those of road sign icons and suchlike public warnings, always playing the role of the *Platonic Ideas visualised*.

42 Halliwell 2002, 178 n. 5: 'children's pictorial mimesis [...] is certainly covered by Aristotle's point.'

43 τῶν ὁριζομένων οἱ ... λέγοντες τί ἐστιν οἰκία, ὅτι ... ἀγγεῖον σκεπαστικὸν σωμάτων καὶ χρημάτων, ἢ τι καὶ ἄλλο τοιοῦτον προσθέντες, τὴν ἐνεργείᾳ λέγουσιν, *Met.* VIII 2, 1043a14–18.

ticles of the substantial, sifted from all that was considered incidental, fugitive and useless in the collective understanding of preceding generations.[44] On the other hand, these stock notions constitute the basis of what we might call *the normal worldview* answering to a given era and culture. These chosen samples of ready-to-use abstractions offered to the child to mimic, or to assimilate by way of exemplary μιμήματα in toy form, rapidly expand the youngling's field of apperception, up to the normal and common level of collective experience and knowledge inherent to an era: in this indeed lies their function. To the extent that the pupil merely repeats the existing models, he implicitly imbibes the historically conditioned and limited, viz. average, standard, no-nonsense middlebrow worldview of a given time and culture. That is why such fundamental education never escapes the overarching framework of a given 'horizon of expectation'. This too finds its expression in the morphology of the first educational tools, in the expected logical and ethical content as well as the corresponding visual styling of these childish projections of the Platonic Ideas. (The toy horse was naturally inconceivable in the toy armoury of little pre-Columbian Indians, in a culture that was unaware of the existence of the respective zoologico-logical species; on the other hand, toy Indian warriors have a special cultural and ethical connotation in the context of the toy game inspired by the heroic myth of the white pioneers of the West, which was publicly favoured until quite recently.)[45] Toys also change over time, they

44 Toys thus play the role of materialised standards stored in the toy aisle as in a sort of a Platonic 'bureau of weights and measures'.

45 One of the traditional functions of the toy is also to imprint a binary gender stereotype, and this by crediting one group of little users with the passive and conservative role of a static, peaceful and caring guardian of the household, goods and offspring; and the other one—with the active, penetrating and adventurous role of a rover, pioneer, warrior, conqueror, destroyer and builder, leader and winner in the field of honour, military and intellectual alike. So there are female and male, pink and blue toys. This is why a boy who plays with dolls, gently dressing, combing, feeding and rocking them like little toy sisters, is even today regarded with some scepticism as a not entirely a standard occurrence (if not a matter of some concern), although this type of playing might indeed be productive in reinforcing the virtues of brotherly love or philanthropy at large. On the other hand, a no less disturbing symptom would be the Amazonian aptitude of a little girl to 'kill', that is, to break and tear her dollies—a general treatment of toys as 'opponents'—even when the tearing apart is an expression of intellectual curiosity to find out what is hidden inside and how stuff works: whether the *disiecta membra* of the torn puppet could perhaps be reassembled into a new, original, non-serial creature (not necessarily anthropomorphic), a remaking that may defy the usual assembly instructions. Thus toys also play their pioneering role in the process of individual acculturation, largely articulated in terms of the gender binary, that colossal and fascinating cultural construct (ultimately resulting from

become obsolete, forsaken and discarded, or they are updated and replaced with new items, always faithfully reflecting the normal, mediocre level of the collective ἐπιστήμη of a given culture.[46] If the toy, as is usually said, helps the child to unleash their imagination and intelligence, it is important to bear in mind that this liberation has in any case its insurmountable frontiers and strictures, predefined precisely by this common worldview of an era that finds its concentrated Platonic expression in the graphic images of the first educational patterns and tools. These are logical and ethical provisions for the life bestowed upon the child by their first teachers.

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a far-reaching process of symbolical encoding of morphofunctional distinctions between the two types of genitals encountered in humans) dominating not only the psychological self-perception and social conduct of every individual but also the general character of some of the most basic cultural institutions (customs, religion, art, literature) of all times and all civilisations. Yet, in actuality, τὸ δὲ ἄρρεν καὶ θῆλυ τοῦ ζῴου οἰκεῖα μὲν πάθη, ἀλλ᾽ οὐ κατὰ τὴν οὐσίαν ἀλλ᾽ ἐν τῇ ὕλῃ καὶ τῷ σώματι, *Met.* X 9, 1058b21–23.

46 Certain μιμήματα also reveal traces of ancient pondering upon the causes of the mimicked things: this implicit theory is indicated as well in the appropriate visual cues of the traditional logo. So the ancient μίμημα of the rising/setting sun—the notorious semicircle bordered by radial dashes (a regular ingredient in childlike depictions of a 'smiling sun')—evinces, along with the basic character of a heavenly radiator of light and warmth, also a clear vestige of an age-old cosmological lore on the fiery disc (light deity) recurrently emerging from and plunging into an underground area (mainly conceived as an aqueous chasm at the edge of the horizon). The mimetic representation of the sun as a radiating semicircle thus connotes an entire theoretical background that is completely foreign to the present-day heliocentric worldview: the latter has actually put an end to the rising/setting sun concept of the ancients—while leaving it frozen in the traditional μίμημα.

3. Imitating the Wild

As well as being the first teachers of universal concepts, toys are also the first and most natural spreaders of the so-called *pathetic fallacy*, an extremely helpful logico-psychological contrivance enabling humans to effectively meet the challenges of the non-human, natural, wild and uncontrollable: the *random accidents* (συμβεβηκότα) that have not yet been logically processed, digested and assimilated as essential and defining features of things. This is why the toy μιμήματα so often take the form of the wild, which now appears under a typically pacified and domesticated—anthropomorphic guise. Hence toy animals—and they have always formed the core of the toy basket assemblage—provide an unsurprisingly distorted and biased picture of the true zoological nature of the species represented: these tendentiously selected and reshaped resemblances of wildlife have indeed little to do with the wilderness of the real fauna, against which the child's phantasy is fairly well protected by the general anthropomorphism of a systematically implanted pathetic fallacy. All this wildlife, transformed into a fabulous world of animal toys, is therefore somewhat reminiscent of that mythical garden inhabited by enchanted humans, changed by the sorceress Nature's rod into rough and hairy beastlike appearances, their voices taken away, but their human awareness and affections left unaffected. Toy animals are thus always somehow conceived as half-humans trapped in the clumsy, inappropriate bodies of the 'other', and therefore essentially frustrated, hampered and ultimately *unrealised* in their full ontological potential: 'noble savages', stuck halfway to full human nature, yet otherwise harmless, cute, gentle and a little comic indeed: charmingly awkward in their attempts to imitate us, their more advanced cousins—always in nostalgic search of their lost identity

of old.[47] The image of the wilderness conveyed to the minds of young users by means of toy animals is thus always an image of a nature that is substantially inferior, handicapped and disadvantaged: already subdued and placated before the onset of its full metaphysical 'colonisation' (occurring only at a later age).[48] The rocking horse is normally tamed, bridled and mounted often well before the child faces the real equine (and is fascinated or dismayed by the spectacular physique of the real beast). The real bear is mollified and debilitated into the teddy bear, ending in the iron grip of the child's caressing hugs. And although most real brutes do not normally show any particular concern for humans (except sometimes as potential prey or as simple forage suppliers), the cuddly animal μιμήματα always rush into the arms of man, reminding him that *he* is their undisputed lord and namegiver ('nicknamegiver' would frankly be a more appropriate denomination), the one to whom they readily yield their speechless mouths to receive the bridles and reins of logical determination, the blessed gift of logos and definition.[49] In their eagerness to prove themselves worthy to be admitted into the community of the accomplished and enjoy the full rights of humanity, these eternal minors even wrap themselves in human clothes, taking on joyful baby faces full of expression, even babbling the meaningful sounds of human language, as appropriate to their age.[50] This universal anthropomorphism, a

47 The concept of 'the past humanity of animals' is not unknown to some indigenous cultures as well. According to the cosmological notions of the Amazonian natives, 'animals [...] are transformations of a primordial, universal humanity' (Viveiros de Castro 2004, 476, 477). 'Such a notion is often associated with the idea that the manifest bodily form of each species is an envelope (a "clothing") that conceals an internal humanoid form [...] Having been people, animals and other species continue to be people behind their everyday appearance' (ibid. 465, 466).

48 In this sense, toys play a pioneering role in the constitution of experience: they impose a default measure, a kind of transcendental anticipation of the future full-scale experience, defining its absolute limits, the expected and desirable canonical size of its entelechy. Put in terms of Aristotle's metaphysics, the toy is the bearer of the final cause (τέλος) of the mature, fully accomplished apperceptive experience of the adult mind (see below, n. 304). Maturation is thus in a way the fulfilment of a program already defined by toys in the first months of life. 'Therefore the games should mostly be imitations of what one will deal with later [= in adult life]' (διὸ τὰς παιδιὰς εἶναι δεῖ τὰς πολλὰς μιμήσεις τῶν ὕστερον σπουδαζομένων, *Pol.* VII 17, 1336a33–34). Cf. Plato, *Rep.* III, 395d and *Laws* I, 643b–c. See Halliwell 1986, 70 n. 34; also idem 2002, 178.

49 The present speculations on the role of children's toys in the process of 'colonisation' of the natural world by placing it under the ultimate authority of the 'pure concepts of the understanding' are largely related to the general conceptual framework elaborated in the classic study *Dialectic of Enlightenment* by M. Horkheimer and T. Adorno.

50 Toy animals are precisely the projections of the very children who own them, manipulate them and mirror in them: the mirror lookalikes of immature, underage humans as such—'subhumans' desperately desiring to grow up and achieve the status of full-fledged men. Yet on the other hand, it is the very scaled-down proportions of the

general assimilation to human, or indeed child-scaled, proportions—an interpretation of all natural phenomena in terms of the soul and body of man, nay toddler—does not stop at the animal world, but extends to inanimate nature as well, reaching even to such areas as have long been staked out and marked by flags of definition, law and order: in the realm of toys, even lifeless things receive faces, limbs and human manners, the obvious markers of an all-victorious panlogism, gradually infused into the worldview of every growing human. Toys, these vivid embodiments of basic conceptual determinations, are therefore not only elementary transmitters of the first cognitions that outline everyman's worldview, but also the earliest and most decisive disseminators of the beneficial pathetic fallacy turning the impenetrable otherness of nature into 'forests of symbols, which observe him with familiar glances'—the magic mirror of a ubiquitous humanity.[51]

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toys as such—their basic *scale model character*—that allows the clear overviewability and manageability of the context, as well as the possibility of contextualisation itself. As small as he is, the child is, after all, the physical and intellectual sovereign of his teeny-weeny, handy and readily manageable menagerie.

It may seem that *oversized toys* create a problem here: those giant teddy bears, exceeding the proportions of the child and placing him in the 'subordinate position' of someone being hugged rather than hugging. Do they undermine the validity of the present argument? Well, we think not. Although the stuffed animal now rises above the child's size, as well as the size of its own natural prototype (the real bear whose idea it represents), it still does not deviate from its basic nature and main purpose as a toy, nor indeed from its own *default size*, which nevertheless remains 'childish' and scaled-down in an absolute, unqualified sense (i.e. whatever the relative size of a particular piece, see below, n. 95). Moreover, finding themselves among objects from the adult world and surpassing them in size, the giant puppets somehow commensurate their rival neighbours to an infantile perspective of their own, thus contributing, in their own controversial way, to the common task of every toy as such: and that is *the overall ludification of reality*. By conceding to the dimensions of giant toys and conforming to their proportions, the rest of the world—a world in which humans are brought into the paradoxical situation of being smaller than puppets and surveyed by them from an overhead perspective—becomes a kind of Brobdingnagian doll's house in which the roles of player and plaything, master and pet, big and small, adult and infantile, are giddily inverted and confounded with each other. And the end result is once again—*a ludificated, scale-modelled world*.

51 According to Eugen Fink, play is a uniquely human mechanism of parrying and counterpoising the overwhelming universe in terms of symbolic or representational 'corresponding to what transcends the human' (Entsprechung zum Übermenschlichen), which would amount to a kind of overall *philosophical ludification of the universe* (much in the vein of Heraclitus and Nietzsche): 'If the essence of the world is thought as play, it thus follows for the human being that he is the only being in the vast universe who is able to *correspond* to the prevailing whole. Only in the correspondence to what is beyond the human may the human being then attain his native essence' (Fink 2016, 31 = Fink 1957, 51, emphasis in original).

4. Imitating the Agon

The world in which playthings play things is *the world of the game*. The rules of games governing the microscopic world of toys and their mutual relations thus correspond to the general laws of nature and human society governing the macroscopic world of real things and their real interrelationships. Being engaged in a game—in which the anthropomorphic toys mimic real things, while the set of pre-agreed rules of the game assumes the role of the general laws of nature and human society—the child becomes accustomed to looking at the multifarious vicissitudes of real-world affairs in terms of simple kaleidoscopic repositioning of a finite number of invariable 'pieces' within an infinite number of variable, yet theoretically predictable, constellations taking their turns on the great game board of nature.[52] The invariable 'pieces' are certainly the toys themselves: embodying the basic concepts, *ur*-concepts, they are distinguished mostly by the perfect stability and reliability of their axiomatically simple, perspicuous and univocal (and, indeed, heavily anthropomorphic) features allowing of no alterations and development, at least not within a single game.[53] As for the game proper—board games have in this re-

52 The course of the game—be it a usual board game or children's play in the proper sense, i.e. a free imaginative improvisation including a number of toys arbitrarily interrelated and animated (as in the well-known dramatic enactments with toys playing the allotted roles, while being accompanied by 'stage directions' and dialogues uttered aloud by the small directors)—always relies on exploiting *the infinite aleatory potential of a finite set of conventional rules* that are either inherited or freely extemporised to be strictly adhered to in the context of a single game.

53 Alterations, if any, do not affect the substantial identity, but only the 'phenomenality', the accidental 'appearance' of a thing (see below, n. 95). If the prince is turned into a frog, then the true identity of the frog consists in its being the prince, who is in any

gard a canonical status—they are actually always a mimesis of a real, material *agon* unfolding within the realms of nature and human society,[54] a simulacrum of a true contest normally entailing actual warring parties, those that seriously plot against each other's lives. The real agon, unlike its artificial simulation that takes the form of a game, is therefore always a sphere of real crisis and uncertainty. Mostly fickle, irregular and dirty, unfair, swindling, messy and bloody, the real-life agon continually tramples over and bypasses the very rules it is founded upon: these are freely obliterated and then tinkered with anew from one occasion to the next, leading to the arbitrary elimination of this or that conflicting side, or both of them, or even all the rival parties together, regardless of the merits and initial advantages or disadvantages of one or the other. The real agon often paradoxically favours the unfit, the unworthy and the base, and punishes the skilful and the virtuous, now rewarding both sides, now scourging them without distinction and for no apparent reason. It almost always eventuates in an 'unjust' outcome, an undeserved defeat and destruction of the opposite sides, one or both at once. It is not unusual that all the participants turn out to be the collective collateral damage of a single match.[55] On the other hand, the game—a bloodless mock agon—proves to be a veritable travesty of the real, life-or-death fight.[56] Its predictable

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event earmarked to finally—after a period of temporary enchantment—return to his original mode of existence, which has essentially never been lost. Anyway, the child himself does not allow the spell to be broken prematurely, as in the case of a boy seated at the front of a row of chairs, decidedly preventing the disenchantment of his enchanted train, no less than his own as its 'engine' (Huizinga 1955, 8 = Huizinga 1950, 35). (Ludic enchantments and disenchantments should in no way be confused with *transubstantiation* in the proper, theological sense. In this latter case, the alteration originates in the divine will, while in the former, the change has its origin in purely human, and moreover, childish volition. This is why ludic metamorphoses have no *mystical* character, being only symbolic and apparent, of which a child himself is indeed fully aware; whereas sacramental transubstantiation is, on the contrary, mystical in the most eminent sense; see below, n. 292.)

54 From a child's and a childish perception, there is no essential difference between the laws of nature and those of human society: the laws of man are conceived by analogy with natural laws and the laws of nature by analogy with those governing social relations.

55 Among all known games, gladiatorial combat *sine missione* would be closest in nature to that of the real agon.

56 The reader will observe that the term *agon* as applied here has a distinctly non-Huizingian flavouring (the Dutch scholar, as is known, 'considering the ludic function to be inherent in the agon', Huizinga 1955, 90 = Huizinga 1950, 118). In our context, however, agon appears as a neutral generic term including both the orderly competition of the sporting game and the unruly mayhem of 'total war' ('the surprise, the ambush, the raid, the punitive expedition and wholesale extermination', Huizinga

reversals always occur under an agreed set of clear, orderly and inviolable rules: that is why such a struggle is of necessity fake. Since the beaten side stays in life no less than the victorious one, there is no real loser, one who would be seriously wounded or driven out of existence. Instead of being expelled into real not-being, as normally happens in a real-life agon, the fallen antagonists, 'pieces', are merely 'captured', pulled off the board and moved to the box, as to a kind of resurrection tomb whence they resume their usual turns whenever the time comes to emerge into the light and line up for a new onset. Through the game, the child gets used to perceiving a dramatic aspect of the real agon—the uncontrollable clashing of the

1955, 90 = Huizinga 1950, 118). At any rate, it should be noticed that classical Greek of the fifth and fourth centuries is not unfamiliar with either of the senses, favouring neither at the expense of the other (see LSJ 18–19, s.v. ἀγών, III 1 and 2). The well-known quadripartite typology of games proffered by Roger Caillois also includes agon, as the first (and in a sense 'classic') type of game, which in principle retains the essential features of a cultivated and culture-bearing competition à la Huizinga. The novelties are the remaining types of games, according to Caillois's systematisation: *alea* (games of chance), *mimicry* (games of disguise) and *ilinx* (games of ecstasy and dizziness). Caillois's astute analysis of hazard in the case of *alea* reveals the ultimately illusory nature of gambling loss and gain—a mechanism embedded in the very essence of aleatory games as such: '*Property is exchanged, but no goods are produced.* What is more, this exchange affects only the players, and only to the degree that they accept, through free decision remade at each game, the probability of such transfer' (Caillois 1961, 5 = Caillois 1958, 16–17, emphasis in original). The only risk is that of choosing 'a response *which is free within the limits set by the rules*' (Caillois 1961, 8 = Caillois 1958, 20, emphasis in original). '*Agôn* and *alea* imply opposite and somewhat complementary attitudes, but they both obey the same law—the creation for the players of conditions of pure equality denied them in real life. For nothing in life is clear, since everything is confused from the very beginning, luck and merit too. Play, whether *agôn* or *alea*, is thus an attempt to substitute perfect situations for the normal confusion of contemporary life. In games, the role of merit or chance is clear and indisputable. It is also implied that all must play with exactly the same possibility of proving their superiority or, on another scale, exactly the same chances of winning' (Caillois 1961, 19 = Caillois 1958, 38–39, emphasis in original). As for *mimicry* and *ilinx*, both are actually a kind of harmless *simulation of transcending into otherness*—either external, natural and social (mimicry), or internal, psychological and mental (ilinx). In both cases, the adventurous 'bathysphere' of the game, challengingly plunged into the profundities of both the outside and the inside worlds, is in the end still umbilically attached to a 'mother ship' of rules, conventions and social considerations safely floating on the surface of normality. For in the event of a 'cable break', the game gets distorted into its own *corruption*—so here we are no longer dealing with the game in the proper sense (Caillois 1961, 51 = Caillois 1958, 85). (Anyhow, Caillois is certainly wrong when he lumps gladiatorial combats alongside boxing and wrestling, as purported games of the ilinx type; the context also does not make it clear enough whether observation or active participation is meant, Caillois 1961, 26 = Caillois 1958, 51.)

actual, concrete forces of nature and human society—in a soothing form of a fair play, clean and honest sport, wherein all the moves, all the mutual 'blows' of the competing sides, are patiently exchanged in restrained and polite alternation, 'with kid gloves', in conformity with a neatly prearranged ruleset ('the general laws of nature and society'). 'All war is spellbound onto this board and into these pieces.'[57] Given that the vanquished are no less spared than the winners, the victory in such a bloodless surrogate for war—a sporting agon—turns out to be a travesty of a real victory, just as a sporting defeat amounts to a travesty of a real defeat. Both make sport of agon. For the ultimate victory is here pledged to everyone: kings and pawns of both colours, all are essentially predestined to stay up and win the palm of ontological triumph over not-being. In the constant Manichean clinch between the black and white pieces, both are equally subject to the cardinal rule which decrees that there be no killing of captured adversaries. This pseudo-agon not only teaches the child that the real things awaiting him in his future life are *essentially toys*, steady and reliable advocates of basic conceptual features (shaped in a familiar, anthropomorphic guise); moreover, it inculcates in the mind of the little one the fundamental idea that all the diverse relationships between real things are *essentially games*, various 'matches', infinitely reproducible and variable rearrangements of a finite number of fixed 'pieces' (= things) moving along specific fields of the game board (in the only permissible corridors preventing direct contact, collisions and bloodshed), within the limited range of individual movement types strictly specified by a set of simple rules (= the general laws of nature and society).[58] They preclude any prospect of

57 'aller Krieg ist auf diese Platte und in diese Figuren gebannt' (Novalis, *Heinrich von Ofterdingen*, 1. Teil, 9. Kap.; the translation is ours).

58 The essence of true agonism in nature and society consists in giving free rein to the real contingency and the real, substantial annihilation of adversaries as an unavoidable corollary thereof. The essence of the gaming, or sporting agonism—mock agonism—would contrariwise be exactly the taming of contingency (through its redefinition into *probability*, as a sort of paradoxical *precomputable contingency*, that is to say, a theoretically controllable and predictable variability within a pregiven set of rules), and consequent outmanoeuvring of the fatal outcome (through its redefinition into a purely symbolic defeat, one in which real elimination is smoothly substituted with mutual 'capture' of the rival 'men'). The uncomfortable fact of real, radical and incalculable *chance* (such as, for instance, the unexpected outbreak of a viral pandemic, the consequences of which cannot in any way be calculated at the moment we write these lines) is neatly remedied and corrected by means of a self-confident 'calculus of probability'. The devastating reign of *veritable* randomness and hazard in nature and society is thereby systematically diluted into the harmless whimsy of the slot machine. We are seriously inclined to believe that the Wittgenstein's famous 'family resemblances' among the most diverse varieties of games (such as those randomised in *Phil. Invest.*, 66) are all ultimately reducible to this concrete, simple atomic func-

a radical break and uncertainty, disintegration of order and predictability—entropy, decline into disorder, and a real, substantial, not just 'played' and accidental, loss.[59] If toys are elementary concepts in their canonical constancy and immutability, then games would be an elementary school in their expedient casuistry, a propaedeutics to the art of drawing valid conclusions in compliance with a set of general rules governing nature and human society.[60]

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tion—a kind of common 'ancestral gene' present in *each and every* historical species without any exception whatsoever. At any rate, it is characteristic that Wittgenstein's list bypasses a game in which chance is—quite exceptionally and atypically—shown due appreciation as a full partner, completely co-equalled and freed from any ontological handicap, otherwise inherent in every ordinary Wittgensteinian game. It is of course Russian roulette, the enfant terrible of the family. (Yet maybe Wittgenstein 'didn't mean that sort of game'?)

59 'Children may have their real small-scale disasters, but adults have their own very large ones: war, catastrophe, accidents, hurricanes, riots, sickness, and death. The play of disorder and phantasmagoria would then seem to be a universal aspect of all free play, for both child and adult. It is noticeable that there is a very great distance between the real-life disaster and the ludic "disaster". There is not too much resemblance between a war and a circus' (Sutton-Smith 1997, 162–63). Anyway, games are kid gloves that adults are too reluctant to take off.

60 The particular purpose of some traditional toys is *to try the laws of nature* with a view to demonstrating their ultimate triumph over eccentricity and exception. Such a role is assigned to the spinning top, the ancient 'aniconic' toy which is in fact more of an artifice of the direct lesson, a teaching tool, than the usual symbolic representation of an idea. The top does not have its prototype in the adult world, it is not a scaled-down representation of anything 'serious'. Whereas the toy horse is in a way also something else, namely the horse (its essence residing in the Platonic equinity, which in itself only clung onto the outside of the toy), the top is already from the beginning only a top and nothing but it itself (its essence indwelling in its substance). Therefore, without relating to any 'original' that would be outside it, without being anyone's substitute or vicar, the spinning top possesses both the gravity of an ordinary thing as well as the levity of a toy—the serious substantiality of the former, and the unsubstantial seriality of the latter. Being both a plaything and a sort of experimental utensil from a physics laboratory (similar to a pendulum or a magnet), the top is intended to serve as a straightforward confirmation of a peculiar and funny natural phenomenon. The miraculous core of this phenomenon lies precisely in the temporary poise between the forces of eccentricity and normality. Observing this tiny self-controlled and self-sustaining *turbulence* with the curious and confident gaze of the boy in Chardin's painting, the little student gets used to the fact that each repeated outburst of eccentricity initiated by a new spin of the top, each instantaneous exit into the extravagant and the extreme that temporarily defies the law of gravity, must end with the collapse and the ultimate triumph of statics (which, after all, has never ceased to be that supreme body of immanent legislation in all nature and society, the unyielding restraint of the naturally impossible by the naturally possible).

5. Imitating the Substantial Change

As such, the ontology of the toy and the game is in fact most naturally expressible in certain basic terms of Aristotelian ontology. If the game is an imaginary world in miniature in which toys imitate the real things of the wide world—the primary substances; if toys are, in their turn, symbolic representations and visible signs of concepts—the secondary substances; then the basic mechanism of the game would actually lie in that the secondary substances, toys, play the role of primary substances, actual things. If again the real world is a field of real *change* defined by the general laws of nature and human society, the world of the game, as its idealistic simulation, would repeat this real-word change in the fictitious imitative forms defined by the set of the conventional rules of game.

5.1.1 As is known, Aristotle differentiates between two main types of change (μεταβολή): substantial and accidental. Substantial change would affect the individual thing as such, the primary substance, entailing its coming into existence and ceasing to exist, the instantaneous transition from one *contradictory* determination to another: from not-being to being, and the other way around. The birth of an individual instance of the living world, or the emergence of a particular artificial object that was not there before, would therefore mean a substantial change in terms of generation; while the death of a singular living being or the destruction of a singular and unique manufactured thing would constitute a substantial change in the sense of corruption. The substantial change is radical and thoroughgoing, it involves the whole of a substance, and concerns its gen-

eration or corruption in an absolute and irrevocable manner.[61] Unlike the substantial change, accidental change relates to the alteration of the accidental qualifications (πάθη) of a substance.[62] Although remaining one and the same in number, a substance changes in that it receives various *contrary* qualifications: a man is once black, then again white, once small, then big, once here, then there.[63] While the substantial change involves a sudden transition from not-being to being, or conversely, accidental change is marked by continuity: contraries are replaced by successively giving way to one another (usually via several intermediate states), without internal mutations, remaining, each for itself, completely homogeneous and equal to itself.[64] Or, in the words of the philosopher, 'what appears to be most

61 'For unqualified generation and corruption do not derive from aggregation and segregation [sc. of atomic particles], but whenever *this one* changes into *that one* in its concrete whole' (ἔστι γὰρ γένεσις ἁπλῆ καὶ φθορὰ οὐ συγκρίσει καὶ διακρίσει, ἀλλ' ὅταν μεταβάλλῃ ἐκ τοῦδε εἰς τόδε ὅλον, *GC* I 2, 317a20–22). Cf. *Phys.* V 1, 224b8–10, and esp. V 1, 225a12–20, where the 'unqualified generation' (γένεσις ἁπλῆ) is opposed to the 'qualified' one (γένεσίς τις); on which distinction, see below, n. 64.

62 'For in the substrate, one component is logical [viz. definitional, κατὰ τὸν λόγον], another material [κατὰ τὴν ὕλην]. Whenever change takes place in them [= affecting their concrete unity], generation or corruption will come about; whenever again it happens in qualifications and *per accidens*—there will be alteration' (ἐν γὰρ τῷ ὑποκειμένῳ τὸ μέν ἐστι κατὰ τὸν λόγον, τὸ δὲ κατὰ τὴν ὕλην. ὅταν μὲν οὖν ἐν τούτοις ᾖ ἡ μεταβολή, γένεσις ἔσται ἢ φθορά, ὅταν δ' ἐν τοῖς πάθεσι καὶ κατὰ συμβεβηκός, ἀλλοίωσις, *GC* I 2, 317a23–27).

63 *Met.* VIII 1, 1042a32 ff.

64 '[F]or it is not white [= whiteness] that becomes, but it is the wood that becomes white' (οὐ γὰρ τὸ λευκὸν γίγνεται ἀλλὰ τὸ ξύλον λευκόν, *Met.* VIII 5, 1044b23–24); '[F]or the contraries do not change [sc. in itself]' (οὐ γὰρ τὰ ἐναντία μεταβάλλει, XII 1, 1069b6–7). Cf. also Porphyry, *In Cat.* 99.30–100.2 Busse. As for the distinction between *two types of substantial change*—the so-called unqualified and qualified generations (see above, n. 61)—the above-mentioned 'wood that becomes white' as a result of a *change in the wood* that was not white before (a change *in the wood*—to point out once again—and not *in whiteness*, which itself remains unchangeable, if exchangeable) would be an example of a qualified generation (γένεσίς τις): '[F]or instance, a change of a non-white thing into a white thing is a qualified generation [lit. 'generation of *this particular thing*', γένεσις τούτου]; whereas a change of an unqualifiedly non-existent thing into an existent thing is an unqualified generation [γένεσις ἁπλῶς], according to which [= i.e. the latter type of change] we speak of a thing's becoming unqualifiedly [ἁπλῶς γίγνεσθαι], and not of it becoming a particular thing [τὶ γίγνεσθαι]' (οἷον ἡ μὲν ἐκ μὴ λευκοῦ εἰς λευκὸν [sc. μεταβολή] γένεσις τούτου, ἡ δ' ἐκ τοῦ μὴ ὄντος ἁπλῶς εἰς οὐσίαν γένεσις ἁπλῶς, καθ' ἣν ἁπλῶς γίγνεσθαι καὶ οὐ τὶ γίγνεσθαι λέγομεν, *Phys.* V 1, 225a14–17). The same applies *mutatis mutandis* to unqualified and qualified corruption respectively. It is not difficult to see that only unqualified generation/corruption will be a substantial change *sensu proprio*. Cf. Ross 1936, 617.

characteristic of substance is that, even if it remains the same and numerically one, it is capable of receiving contrary qualifications.'[65]

5.1.2 With that being said, the question arises how the microcosm of toys and games could after all imitate the macrocosm of real things, the tangled dynamics of the real world, the perpetual agon of contending forces whose reversals are for the most part capriciously uncertain and incalculable? Or, to put it in the more specific terms of Aristotelian metaphysics: how can toys and games mimic real change, both substantial and accidental? The main issue lies indeed in the fact that toys are symbolic renditions of concepts, that these are genera and species, universals, or secondary substances—which in turn are incapable of being subject to any change: secondary substances are eternal, incorruptible and perfectly unchangeable.[66] Being of such a nature, toys seem quite unsuitable to play the role of changeable objects, viz. that of the primary substances the toys are intended to mimic within the game. Yet it is precisely toys which are destined to assume the role concerned. How, then, could unchangeable secondary substances, represented in the symbolic forms of toys, possibly play the role of primary substances—especially in view of the notorious changeability of the latter?

Viewed from the point of Aristotelian ontology, any possibility of change depends ultimately upon the composite character of the primary substance, chiefly upon the presence of a material substrate (ὕλη, ὑποκείμενον) in the double composition of a concrete individual. Since neither matter nor form, if taken separately, undergoes any substantial change, this could only affect their conjunction, a concrete thing (τόδε ὅλον), one that comes into existence exactly through the association of the two, and ceases to exist through their separation.[67] Hence the substance changes primarily due to the involvement of the material component, which is the main ontological precondition and 'means' of the changeability of an individual thing.

5.1.3 Still, as we have seen, the toy is actually nothing more than a sensible likeness of a concept, a visual token of the Platonic Idea. No toy is essentially an individual thing. The apparent thingness and corpore-

65 μάλιστα δὲ ἴδιον τῆς οὐσίας δοκεῖ εἶναι τὸ ταὐτὸν καὶ ἓν ἀριθμῷ ὂν τῶν ἐναντίων εἶναι δεκτικόν, *Cat.* 5, 4a10–11.

66 Cf. e.g. *An. Post.* I 24, 85b17–18: τὰ ἄφθαρτα ἐν ἐκείνοις [= τοῖς καθόλου] ἐστί, τὰ δὲ κατὰ μέρος φθαρτὰ μᾶλλον ('[W]hat is contained in universals are incorruptible entities, whilst particulars are, rather, corruptible').

67 See *Met.* VII 8; XII 3.

ity of the individual items notwithstanding, a toy remains basically immaterial, intangible, devoid of accidentality, and consequently incapable of being affected by substantial change. The idea (εἶδος) is immortal and indestructible, neither becoming nor ceasing to be:[68] that is why no toy can really come into existence or be truly deprived of it. The equinity of the toy horse neither becomes nor stops being; while the toy horse, for its part, turns out to be nothing other than equinity itself (αὐτόϊππον),[69] symbolically represented by an emblematic ideogram in the form of the respective toy. The toy has no substance other than secondary substance,[70]

68 φανερὸν ἄρα ὅτι οὐδὲ τὸ εἶδος, ἢ ὁτιδήποτε χρὴ καλεῖν τὴν ἐν τῷ αἰσθητῷ μορφήν, οὐ γίγνεται, οὐδ᾽ ἔστιν αὐτοῦ γένεσις, οὐδὲ τὸ τί ἦν εἶναι, *Met.* VII 8, 1033b5–7; φανερὸν δὴ ἐκ τῶν εἰρημένων ὅτι τὸ μὲν ὡς εἶδος ἢ οὐσία λεγόμενον οὐ γίγνεται, VII 8, 1033b16–17; τοῦ δὲ λόγου οὐκ ἔστιν οὕτως ὥστε φθείρεσθαι· οὐδὲ γὰρ γένεσις, VII 15, 1039b23–24; οὐ γίγνεται οὔτε ἡ ὕλη οὔτε τὸ εἶδος, XII 3, 1069b35; οὐδ᾽ ἔστι γένεσις καὶ φθορὰ τούτων [= τῶν εἰδῶν], XII 3, 1070a15. The Idea is not generated in the case of other categories either: οὐ μόνον δὲ περὶ τῆς οὐσίας ὁ λόγος δηλοῖ τὸ μὴ γίγνεσθαι τὸ εἶδος, ἀλλὰ περὶ πάντων ὁμοίως τῶν πρώτων κοινὸς ὁ λόγος, οἷον ποσοῦ ποιοῦ καὶ τῶν ἄλλων κατηγοριῶν, VII 9, 1034b7–10.

69 *Met.* VII 16, 1040b33.

70 If an individual toy horse stands for the concept 'horse', does it not do the same thing as does any individual horse normally standing for the concept 'horse'? Is not the individual toy horse therefore a primary substance of the horse in like manner to any individual specimen of the species 'horse'? Well, surely not. No one will confuse a toy horse with a real one, least of all a child. An individual toy horse—an individual symbolic representation of the concept 'horse'—is only too obviously *not* an individual specimen of the species 'horse'. There is certainly no doubt that among these two individuals, the individual horse alone can be recognised as a full-blooded specimen of the horse species. (As for the individual toy horse, it would, strictly speaking, be solely a specimen of the species 'toy horse', the only concept that an individual toy horse could really 'stand for'.) The most blatant proof that the primary substance of the horse is an individual horse, and not an individual horselike toy, lies in the fact that the real horse can (literally) be ridden, harnessed, groomed, fed, etc., while all this proves completely unfeasible in the case of a symbolically represented animal (except indeed ὁμωνύμως, by the symbolic imitation of the said actions). And yet there is no doubt that both individual horse and individual toy horse share somehow the common *form* (εἶδος) of the species horse, the typical outline (σχῆμα) of the horse shape (μορφή): the toy horse is definitely a horse-shaped toy, a dummy in the form of the horse. Now if the form of the horse be common to both real horse and horselike toy, then the essential difference between the two would obviously lie in the fact that the toy—as opposed to the real animal—lacks the appropriate *matter*, which, again, is exactly *the* part of the substance responsible for its generation, its coming-into-existence (*Met.* VII 7, 1032b30–1033a1). So instead of being duly combined with the ὕλη of the horse, that was naturally intended for it, and it alone (viz. horse flesh and bones), the εἶδος of the horse is now, quite surprisingly, associated with wood, plastic or plush, and thus, in a sense, 'led astray'—ontologically misplaced and miscarried. Such would be the odd conception of this abortive crossbreed of the equid strain, the toy horse, a logico-ontological freak (πήρωμα), doomed to a kind of feigned, apparent existence, only vaguely similar to real life. (The ontological barrenness of the toy horse would

which is indeed common to all individual replicas of the same type: they all represent one and the self-same toy, since each idea is a unique and single-item.[71] Being essentially an idea, the toy proves indestructible, regardless of the possibility that an individual instance of a material toy may be damaged or broken.[72] Given that the substance of a toy does not lie

hence be in a way comparable to that of a mule, yet another 'stray-from-the-path' equine species, mentioned in the interesting passage at *Met*. VII 8, 1033b33 ff.; cf. also VII 9, 1034b3–4) Basically heterogeneous and inappropriate to the related form, the matter of the toy horse never really coalesces with the attached shape of the horse in order to become its organic, naturally indissociable embodiment, i.e. the potentiality of the horse shape (cf. VII 7, 1032b1 ff.). Instead of generating a substance proper, the artificial marriage of depotentialised matter and deactualised form turns out to be a true ontological misalliance, completely futile, inert and devoid of the ability to self-locomote (otherwise typical of all ζῷα). Being left substantially untouched, unfertilised and unimbued by form, the matter of the toy continues to be a mere extraneous adjunct to the accompanying shape, coupled with it only superficially and nonadheringly, a 'vile body', always potentially abandonable without any consequences for the integrity of the form (it is typical that the parts of the toy remain always a mere σωρός, a congeries of disjointed limbs gathered together 'by force or concretion', incapable of being ultimately 'concocted and turned into one thing', VII 16, 1040b9–10; 1040b15–16: τὸ γὰρ τοιοῦτον πήρωσις). So, while the individual horse is, as it were, absolutely *indispensable* (its substantial change signifying a definitive and irrevocable transition from not-being to being, and the other way around), the individual toy horse—individual symbolic representation of a concept 'horse'—would be universally expendable and replaceable, i.e. serially reproducible and repeatable, which clearly testifies to the fact that its substance is *essentially a secondary one*, and that hence every toy horse is *in reality a species, and not an individual proper*. Provided that it can essentially be affected neither by material (hylic) destruction nor by serial replacement of whole individual items, it is clear that the real substance of the toy proves to be secondary (the notorious and oftentimes quoted possibility of unlimitedly replacing a broken chess piece with another one of the same value, or even with an entirely heteroclite material substitute assuming the value of the destroyed piece—without in the least disturbing either the substantial identity of the item or the progress of the game—clearly shows that the substance of all chess kings, queens, bishops and pawns has, at its core, always been secondary substance).

71 *Met.* XII 3, 1070a18–19.

72 Just as the deletion of the circle drawn on the board does not lead to the destruction of the circle shown in the diagram. What here undergoes a substantial change is the primary substance of the individual drawing: a certain amount of chalk powder that 'ceases to exist' as a result of wiping. The substance of the circle, always secondary—actually belonging to the μαθηματικά ('mathematicals'), one of the two main categories of Platonic eternal beings (cf. e.g. *Met.* I 6, 987b14–15; VII 2, 1028b19–20; XIII 9, 1086a11–13; XIV 3, 1090b35–36, etc.)—remains unchanged by this operation (just as it was by that of the 'constructing'). Now while circles fall into the category of μαθηματικά, toys best suit the true Platonic Ideas in their classic sense. Both alike will remain completely untouched by the substantial change affecting their symbolic representatives, individual circle diagrams and individual toys respectively. Cf. *Met.* X 9, 1058b12–15. See below, n. 128.

in the haecceity of a particular piece, even the utter breakage of the latter could not eventuate in the substantial destruction of the toy in and of itself (καθ' ἑαυτό). A toy cannot be broken. A child is actually never able to break his dummy howsoever ruthlessly he hammers with it. And yet it is precisely them, the toys—howbeit intrinsically insensitive to real substantial change—that are charged with the task of imitatively reproducing that same substantial change affecting the real tangible things of the world. How do they cope with this paradox? In fact, a good half of their educational function consists precisely of mastering this successfully.

5.2 Every substantial change mimicked by a game (board games, as we have seen, being particularly exemplary in this sense) is therefore essentially *docetic* in nature. Contrary to real-life experience, in which universal contingency, arrhythmicity and decay largely relativise the authority of order, regular periodicity and the law of conservation, a game will habituate us to the salutary idea that there is no real destruction, dissipation and unplanned loss, that all antagonistic parties are destined ultimately to be spared and redeemed, exempt from generation and corruption, and preserved in their ever-intact substantiality. It is for this reason that any radical and definite outcome as such turns out to be completely alien to the spirit of Olympism. As a consequence, all generation and corruption are replaced by countless disposable 'captures and releases'—effigial substitutes for real substantial change.[73]

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73 Checkmating, as the game capture *par excellence*, places the royal victim in a position of extreme distress, confining him within a single square, as in a kind of isolation cell—yet sparing him from the ultimate 'deathblow' (which, according to the rules of the game and the implied value of the piece, is not taken into consideration anyway). The king could therefore theoretically remain interned for the rest of eternity, with no danger to his substance, which is in any event eternal and incorruptible (being secondary). In this respect, it is also worth recalling the usual duels of toys in which small animators set their champions on each other, hitting them mutually with shouts of 'You're dead!': both parties are all too well aware that the clash of their lead warriors will prove essentially frustrated by the ultimate impossibility of truly and definitely eliminating the opponent's duellist. The substance of toys, being immaterial, must be seen as perfectly insusceptible to injury or destruction (regardless of the severity of the damage to a concrete item). The same soldiers, or their serial replacements (which amounts to the same), appear again and again, always available for paradoxical reiterations of 'mortal combat'. The paradox, however, disappears when we realise that toys—at bottom, secondary substances—have never even moved from not-being into being, so they cannot be bereft of what they never had: a concrete existence. Hence there is no difference between the living toy and the dead toy. Essentially zombies (πηρώματα), toys are by default impervious to lethal blows.

6. Imitating the Accidental Change

The way a game normally imitates the accidental change is actually no less shrewd. Needless to say that the mimicked change is again only apparent, its subject never being essentially affected by the real alteration.

6.1.1 As we know, Aristotle distinguishes three types of accidental change: qualitative, quantitative, and local. In contrast to a change in substance, as a category in its own right, he refers to the accidental changes more specifically as *movements* (κινήσεις).[74] What they affect are certainly individual things, the primary substances, as the only natural substrate (ὑποκείμενον) underlying accidentality. The Stagirite is after all particularly attached to linking the substantiality of the thing to its material component, seeing the matter as the most natural ontological prerequisite for any kind of change: 'That matter is also substance is clear: for in all the opposite changes there is some substrate of changes.'[75] As

74 In *Cat.* 14, 15a13–14, however, he will also include substantial change among the movements. Yet see for instance *Met.* XI 12, 1068a8–11. On the four types of change, see e.g. *Phys.* III 1, 200b33–34 (μεταβάλλει γὰρ ἀεὶ τὸ μεταβάλλον ἢ κατ᾽ οὐσίαν ἢ κατὰ ποσὸν ἢ κατὰ ποιὸν ἢ κατὰ τόπον), and, in greater detail, *Phys.* V 1–2.

75 ὅτι δ᾽ ἐστὶν οὐσία καὶ ἡ ὕλη, δῆλον· ἐν πάσαις γὰρ ταῖς ἀντικειμέναις μεταβολαῖς ἐστί τι τὸ ὑποκείμενον ταῖς μεταβολαῖς, *Met.* VIII 1, 1042a32–34. Strictly speaking, matter is the sole component of the substance liable to accidental changes. Substantial change, on the other hand, only affects the *combination* of matter and form, viz. the concrete, enmattered form (σχῆμα, μορφή, the only possible mode of the form's real existence, according to the basic tenor of Aristotelian philosophy). Taken in themselves, neither is generated (οὐ γίγνεται οὔτε ἡ ὕλη οὔτε τὸ εἶδος, *Met.* XII 3, 1069b35–36). Quite simply, but no less accurately, this can be summarised as fol-

we have seen, the philosopher has in mind two main types of 'opposite changes' (ἀντικείμεναι μεταβολαί): the one, based on *contradictory* opposition (μεταβολὴ κατ᾽ ἀντίφασιν), viz. substantial change, generation and corruption (γένεσις καὶ φθορά) affecting individual things only;[76] and the other, relying on the principle of *contrariety* (μεταβολὴ κατ᾽ ἀντίθεσιν), viz. the accidental change—the movement—or the succession of contrary qualifications inherent in individual things.[77] The latter, as is said, branches additionally into three special kinds:[78] alteration (ἀλλοίωσις), or the succession of the contrary qualities;[79] growth and diminution (αὔξησις καὶ φθίσις), or the sequence of contraries in terms of quality;[80] and lastly, locomotion (φορά), or the change of place according to the pairs of

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lows: a) a substantial change concerns the *link* between matter and form: substance comes into existence precisely through the establishment of this link, and ceases to exist with its rupture ('[W]hat is called form or substance does not come into existence, whereas the union [sc. of matter and form], called after the latter, does come into existence', τὸ μὲν ὡς εἶδος ἢ οὐσία λεγόμενον οὐ γίγνεται, ἡ δὲ σύνοδος [v.l. σύνολος, Jaeger] ἡ κατὰ ταύτην λεγομένη γίγνεται, *Met.* VII 8, 1033b17–18; '[O]f those substances which are so called [viz. concrete things], there is both corruption as well as generation', ὅσαι [sc. οὐσίαι] μὲν οὖν οὕτω λέγονται [viz. τὰ σύνολα], τούτων μὲν ἔστι φθορά· καὶ γὰρ γένεσις, VII 15, 1039b22–23); while b) an accidental change pertains to the *material component* alone (cf. e.g. *Phys.* VII 3, 245b13–246a1), insofar as it can serve as a suitable substrate to its form (for some accidental changes are capable of seriously challenging this inherent capacity of matter to support the concomitant form, while others have no bearing on matter's ability to work as a substrate; the former may therefore have an indirect effect on a substantial change, the latter not). For all specific types of accidental change, see below.

76 '[W]ith regard to [the change in] substance, [there is] something which is now in coming into existence, then again in ceasing to exist, and [which is] substrate now as this individual thing [τόδε τι], now again as [the same thing] in the sense of [its own] privation' (κατ᾽ οὐσίαν ὃ νῦν μὲν ἐν γενέσει, πάλιν δ᾽ ἐν φθορᾷ, καὶ νῦν μὲν ὑποκείμενον ὡς τόδε τι, πάλιν δ᾽ ὑποκείμενον ὡς κατὰ στέρησιν, *Met.* VIII 1, 1042b1–3).

77 'For each movement is a change from one to another, and the same holds good for generation and corruption too; only that the latter are change into opposities in one way [viz. change into *contradictory* opposities], whereas the former, the movement, is change into opposities in another way [viz. change into *contrary* opposities]' (πᾶσα γὰρ κίνησις ἐξ ἄλλου εἰς ἄλλο ἐστὶ μεταβολή, καὶ γένεσις καὶ φθορὰ ὡσαύτως· πλὴν αἱ μὲν εἰς ἀντικείμενα ὠδί, ἡ δ᾽ ὠδί, ἡ κίνησις, *Met.* XI 12, 1068a23–26; the wording 'ἡ δ᾽ ὠδὶ ἡ κίνησις' is that of A^b = cod. Laur. 87, 12). Cf. *Met.* XI 11, 1067b30 ff.

78 '[T]here must be three types of movement, qualitative, quantitative and local. There is no movement with respect to substance as there is nothing contrary to substance' (ἀνάγκη τρεῖς εἶναι κινήσεις, ποιοῦ ποσοῦ τόπου. κατ᾽ οὐσίαν δ᾽ οὔ διὰ τὸ μηθὲν εἶναι οὐσίᾳ ἐναντίον, *Met.* XI 12, 1068a9–11). Cf. *Cat.* 5, 3b24 ff.

79 'what is now healthy, then again diseased' (ὃ νῦν μὲν ὑγιὲς πάλιν δὲ κάμνον, *Met.* VIII 1, 1042a36–b1).

80 'what is now of such-and-such a size, then again smaller or larger' (ὃ νῦν μὲν τηλικόνδε πάλιν δ᾽ ἔλαττον ἢ μεῖζον, *Met.* VIII 1, 1042a35–36). At *De An.* I 3, 406a12–13, φθίσις and αὔξησις are counted as separate movements.

spatial contraries.[81] It is particularly important to observe that the three kinds of movement have no equal status when it comes to their relationship to substance as the material substrate of change (τὸ ὑποκείμενον ταῖς μεταβολαῖς): for some of the movements do involve a change in substance, while others do not. In other words: certain types of movement are able to exert an essential and immediate impact on generation or corruption; whereas others affect it only partially, or not at all. Now which movements are able to change the thing in its substantiality, and which again are not? The philosopher is explicit: the quantitative movement always involves a substantial change; the qualitative sometimes; the local—never.[82]

6.1.2 Thus *every* change in quantity involves the *whole of the substance*: what grows or decreases is always an individual thing in its entirety. Furthermore, the *extreme* values of quantitative contraries always directly threaten the existence of a substance as such: the Procrustean treatment of a body, whether animate or artificial, inevitably entails its ultimate change in substance (although not always necessarily ending in it).[83]

Alteration, or change in quality, also involves a substantial change, yet not without any exception, since a change in substance is sometimes missing, despite the intensity of an affection.[84] One is now healthy and then diseased, while some diseases—those 'pushed to the extreme'—may have a fatal outcome (although not necessarily). The reason for this is that the transition from health to disease, or vice versa, *involves all of the substance*, the body taken in its integrity.[85] It is true, though, that a sizeable number

81 'what is now here, then again elsewhere' (τὸ νῦν μὲν ἐνταῦθα πάλιν δ' ἄλλοθι, *Met.* VIII 1, 1042a34–35; *Cael.* I 4, 271a26–28). Plato already disambiguates two types of movement, ἀλλοίωσις and φορά (*Tht.* 181d).

82 '[T]he moving thing departs [lit. 'steps out'] least from its substance [viz. essence] when in local movement—compared to all other kinds of movement: for this is the only movement that does not change anything of the being [τοῦ εἶναι], about as well as in the case of the altering thing, it is the quality [sc. of substance] that changes, and in the case of the thing which grows and diminishes, it is the [substance's] quantity that is subject to change' (ἥκιστα τῆς οὐσίας ἐξίσταται τὸ κινούμενον τῶν κινήσεων ἐν τῷ φέρεσθαι· κατὰ μόνην γὰρ οὐδὲν μεταβάλλει τοῦ εἶναι, ὥσπερ ἀλλοιουμένου μὲν τὸ ποιόν, αὐξανομένου δὲ καὶ φθίνοντος τὸ ποσόν, *Phys.* VIII 7, 261a20–23). Cf. *Top.* VI 6, 145a3–4, 9–10.

83 A procedure for testing the ability of accidental qualifications to bring about a change in substance *if (theoretically) pushed to the extreme* is the original invention of German philosopher Sebastian Odzuck: 'Thus, if something keeps on growing and exceeds this natural limit, it no longer fulfils its essence and in this sense is no longer the substance it was before, in other words, it has changed in essence' (Odzuck 2014, 204).

84 See ibid. 195 ff.; 196–97. Yet see below, n. 87.

85 'My claim is that certain alterations something *x* may undergo as a whole can result in *x* undergoing a change in essence in the sense that if the alteration goes on for too long and in consequence the respective quality becomes too extreme this ultimately

of alterations are trivial and without essential consequences, as they do not concern the substance in its entirety, thus leaving no effect on it as a whole, not even when the changing quality reaches its extreme value. One is now dark-haired and then grey-haired (in the aftermath of the natural greying process), yet neither any of these qualities, nor the transition from one to the other, nor indeed their 'extreme values' (whatever that may mean in the given instance), none of this could possibly cause a substantial change (or at least establish itself as 'the first step towards a change in substance'). The reason lies in the fact that alteration—unlike a change in quantity—does not *always and without exception* involve the whole of the substance.[86]

The position of locomotion is however pretty unique: '[I]t is not necessary if something has matter for local movement [ὕλη τοπική, 'local matter'], that it should also have matter for generation and corruption [γεννητὴ καί φθαρτή sc. ὕλη].'[87] What Aristotle actually has in mind is the celestial bodies he imagines as deities endued with a special kind of un-

results in a change in substance. [...] This, of course, does not mean that every alteration leads to a change in substance, but only such as involve an affection's becoming too extreme' (ibid. 203–4).

86 Odzuck ignores this basic criterion for delineating alteration from change in quantity (which is indirectly alluded to at *Met.* VIII 1, 1042b5, a most noteworthy passage to which the German scholar puzzlingly makes no reference): in contrast to alteration that only *occasionally* involves the totality of the substance—*every*, howsoever partial and minuscule, change in quantity *always and without exception* involves the substance in its wholeness—a change in substance. So while the change in hair colour only affects a part of the body, even the slightest swelling of the pinkie finger automatically matters to the body in its integrity, and not the affected part alone (a barely perceptible enlargement of a finger already participates in an overall increase of the body as a whole, cf. *GC* I 5, 321a2–3; 321a19–20; 321b14–15). No matter how negligible, this tiny quantitative change turns out, nonetheless, to be 'the first step towards a change in substance [...] embarking on the process of departing from the essence' (Odzuck 2014, 205), although a substantial change itself, of course, need not always be carried through. In the case of a change in quality, on the contrary, there is no such automatic and absolutely exceptionless entwinement between the parts and the whole: alteration in principle allows for a certain autonomy of the parts, so that sometimes even the most extreme values of qualitative change affecting individual parts remain without repercussions for the remainder of the body (as in the case of the colour 'extremes' of the grey-hairedness consequent upon the natural change of hair colour: from black to grey, from grey to greyish-white, from greyish-white to white and further on to *extreme white*—none of these intermediate steps counts as 'the first step towards a change in substance').

87 οὐ γὰρ ἀνάγκη, εἴ τι ὕλην ἔχει τοπικήν, τοῦτο καὶ γεννητὴν καὶ φθαρτὴν ἔχειν, *Met.* VIII 1, 1042b5–6. Yet according to *Met.* IX 8, 1050b17, this reservation would also include matter for alteration: in consequence, neither ὕλη ἀλλοιωτή would entail substantial change.

generated and incorruptible matter, typical of the godlike beings of the supralunary region.[88] Their movement (otherwise permanent and circular, originating from the 'unmoved mover' and conveyed by a number of subordinate unmoved movers)[89] reflects their own imperishable materiality,[90] for locomotion undergoes no affection on the part of matter for generation and corruption,[91] the celestial bodies being divine, unborn and immortal, not susceptible to any substantial change. However, the fact that locomotion does not involve a change in substance can as well be taken in a more ordinary, this-worldly sense, applying to any 'normal' locomotion within the sublunary sphere we inhabit.[92] No locomotion has any essential bearing on the substance affected by it. A simple shift from one place to another cannot prompt any change in the substance of the moving object. The horse experiences no substantial change as a consequence of simply leaving the barn and going to the pasture. The glass remains perfectly unchanged in substance, whether it stays on the shelf or is transferred to the table. It is true that some of the local changes may indirectly eventuate in a change in substance: the glass may indeed break due to an 'extreme' move sideways, i.e. over the edge of the table; yet the real cause of a substantial change is never locomotion itself, but some accidental agent, external to it (e.g. lack of support to the falling glass).[93] Consequently, locomotion

88 *Met.* XII 1, 1069a31. The celestial bodies have ὕλη τοπική but not ὕλη γεννητή, VIII 4, 1044b7–8; XII 2, 1069b25–26.

89 *Met.* XII 8, 1073a23 ff.

90 It is elsewhere (as in the spurious *On the Cosmos*) conceived as a 'fifth element', and labelled *aether*, according to a false etymology that specifically points out its locomotor capacity: οὐρανοῦ δὲ καὶ ἄστρων οὐσίαν μὲν αἰθέρα καλοῦμεν ... διὰ τὸ ἀεὶ θεῖν κυκλοφορουμένην ['*ever-running* in a circle'], *Mund.* 2, 392a5–8; cf. *Cael.* I 3, 270b20–24; also *Meteor.* I 3, 339b25, Anaxagoras apparently being the first to technically use the traditional term, 339b20–24; see also Plato, *Epin.* 981c; 984b).

91 'Matter (ὕλη) being for Aristotle that which is presupposed by change, a thing that can change in all four ways is regarded as embedded, as it were, in four layers of matter—"local matter" or matter for locomotion, matter for alteration, for change of size, for coming into being and passing away. These have a definite logical order; the second presupposes the first, the third the second. The fourth and third imply one another. The three last are *in fact* always found together; they belong to all sublunary bodies. "Local matter", however, is not only logically independent of the other three, but can exist apart from them, and does so exist in the heavenly spheres, which accordingly are "more divine" than terrestrial things. Every individual thing in the world except minds is a union of form with at least "local matter"' (Ross 1923, 167).

92 Which still derives its momentum from the upper world, and ultimately from the *primum mobile*, cf. *Met*. XII 8, 1074a28–31.

93 'Yet, it is important to emphasize that these [= substantial] changes do not happen solely in virtue of the subject's suddenly being at some other place, but because of what is at the respective place' (Odzuck 2014, 206). The latter, incidentally, may

proves to be the only kind of movement entailing no substantial change whatsoever.[94] Although it cannot subsist without things, as the only natural bearers of 'local matter', this kind of movement—despite being the most typical and the most obvious one—is actually the most abstract and most attenuated and 'idealistic', the least material in comparison with the other two, which are lot more 'somatically' involved in the solid sensible interior of the substance.

6.2 Let us now return to games. If we pay attention to the way the game imitates accidental changes, we immediately notice that among the aforesaid three kinds of movement, it almost unequivocally chooses one alone: locomotion, largely ignoring the other two. Locomotion stands at the base of each game as such (especially board games). In mimicking the most diverse changes in the real world, the game reduces them all solely to the relations of spatial movements. The reason is clear: since the toy is by itself a pure concept, a secondary substance, it is essentially immaterial, devoid of potentiality, and accordingly out of reach of most accidental changes. How could a concept—an eternal and unchangeable essence—be now this way and again that way? Now small and again great, now black and again white? Would it not be so obliterated, exactly as a concept? It is indeed true that a particular piece of a toy might at some point be shaped small and then redrawn into larger proportions, or change colour, in like manner as a particular drawing of a circle could now be fashioned small now big, now black now white. Yet taken by themselves, neither toys nor circles—being *per se* purely conceptual and hence insusceptible to any alteration or change in quantity—could have a colour or size capable of being changed and superseded by its contrary.[95] This is why changes in qual-

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be responsible not only for the ceasing to be (as e.g. in the case of movement in a minefield; see also Odzuck's own instance of a goldfish jumping out of a fish tank, ibid.), but also for coming into existence, as in the biblical parable of the sower: 'Some [seeds] fell upon stony places [...] and [...] withered away. [...] But other fell into good ground, and brought forth fruit' (Matthew 13:5–8 KJV; compare the analogous locomotor alternatives of a spermatozoon while 'gropingly' trying to penetrate the egg). In none of these instances did locomotion itself involve a change in substance, this change having occurred as a result of an extrinsic reason, which was in fact only *elicited* by locomotion and should not be confused with it.

94 Odzuck 2014, 201: 'Since locomotion does not affect its subject's inner attributes, one accordingly may say that it cannot be a part of a change in essence in the way alteration and change in quantity can.'

95 The toy elephant is large in an absolute and unqualified sense (it is actually the very epitome of the concept of 'the largest animal'); the toy mouse again is absolutely small ('the smallest animal'), regardless of the relative size of a particular specimen of the toy, which may vary, viz. undergo quantitative change in the ordinary sense (see above, n. 50). Hence an individual toy mouse may be comparatively larger than an individual toy elephant, although—taken in an absolute and unqualified sense—

ity and quantity play virtually no role in the world of toys and games (toys are typically 'unchangeable', stiff and 'puppetlike', rigid just like the rules of the game that govern their movements). The dynamics of the world of toys and games, its specific agonality, rests on another type of change and movement—locomotion.

6.3 Although locomotion is the only type of accidental change normally suited to the nature of the toy,[96] the child is by no means denied

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the toy elephant would always be larger than the toy mouse. While being characterised by the *quantitative* invariants of absolute smallness and largeness respectively, toy mouse and toy elephant are at the same time characteristically distinguished by the common *qualitative* accident of greyness. Although individual specimens of toy mice or elephants may be of any colour, no blue mice or pink elephants will ever question this inherent and inalienable quality of a basic, absolute and unqualified greyness, normally pertaining to the concepts of mouse and elephant (though not necessarily seen). The child will always be perfectly aware that his pink elephant is *as a matter of fact* grey—grey by default—because every elephant is grey, and the toy elephant is nothing but the symbolic representation of this Everyelephant. Every blue mouse and pink elephant would therefore be principally and normally grey—grey in an unqualified, invariable and canonical sense—sharing the common *inseparable accident* of greyness, normally concomitant with the concept of mouse as well as that of elephant (though not necessarily seen). Properly speaking, if the greyness turns out to be the *inseparable* accident of the given toys, the blueness, or pinkness, or whatever colouristic quality, would be best designated as their *separable* accident, the former normally relating to the immutable and abiding concepts symbolically represented by the respective toys; the latter again—to the concrete, changeable and volatile individual toy items as such. The same holds good also of the aforementioned quantitative accidents of smallness and largeness pertaining to the concepts of mouse and elephant respectively: being virtually inalienable from the given concepts, these accidents turn out to be *inseparable quantitative accidents* of the respective toys (the toy mouse is absolutely and unqualifiedly small, 'the smallest animal'; the toy elephant again absolutely and unqualifiedly large, 'the largest animal'); whereas the relative smallness/largeness of individual toy specimens (allowing an individual toy mouse to be comparatively larger than an individual toy elephant) would consequently amount to the *separable quantitative accidents*, pertaining to the individual items alone. For inseparable accidents (ἀχώριστα συμβεβηκότα), see Porphyry, *Isag.* 12.26–13.3; 21.21–22.10 Busse; classic instance is the blackness of ravens and 'Ethiopians', virtually inseparable, yet capable of being thought away 'without destroying the substrate' (and *therefore* 'accidental'). According to Alexander of Aphrodisias, the inseparable accident is not really inherent in the substance, being neither the matter nor the form, but a sort of inseparable concomitance of their linkage ('a by-product of what happens to the matter in its change into such and such a form', τῷ δὲ συμπτώματι τῆς ὕλης ἐπιγινόμενον ἐν τῇ εἰς τὸ τοιοῦτον εἶδος μεταβολῇ, *In Top.* 51.2–3 Wallies; cf. Van Ophuijsen 2001, 54). Thus, a separable accident would belong to an individual specimen of a toy, and an inseparable again to a toy as a representation of a concept—a specific kind of 'predicable' involved in the concept represented, certainly not as a part of its formal definition, yet as a kind of its inseparable connotative retinue (part of its 'apophatic definition', cf. op. cit. 48.21 ff.).

96 Accordingly, all the rules of the game apply solely to the toy's locomotor properties. Each piece of toy, especially the board game piece, is defined primarily with respect

the opportunity of modifying his particular example of the toy in a whole variety of ways other than simply changing its position in space. It is well known that children generally do not hesitate to imaginatively interfere with their individual sample by supplying it with various quantitative and qualitative features that were not originally associated with the type of toy in question (by arbitrarily reducing or enlarging its original shape, or staining it with random, 'non-genuine' colours, 'drawing a moustache onto it', or even tearing it apart). However, all these interventions performed on *an individual specimen of the toy* actually have no effect on either the accidental or the substantial identity of *the toy as such*. The child is, after all, fully aware that his toy can only be duly changed in terms of locomotion, while any other attempt at accidental change would necessarily be irregular and illicit—a simple mistreatment which, like physical destruction itself (substantial change), can only affect the concrete item, leaving the toy *per se* intact and unchanged. That is why every attempt on the part of the child to variegate his toy otherwise than *appropriately*—and the only appropriate way of changing the toy would indeed be that of locomotion, the simple moving of the toy in space—proves ultimately vain and doomed to final frustration. For the toy is relentlessly *resilient*: no matter how utterly oppressed or disfigured (in the element of the individual copy), it always stubbornly resumes its original form.[97] This is so because the toy is actually nothing but this (symbolically represented) form itself, the very εἶδος, the transcendent, imponderous, intelligible entity finding itself right in the midst of the sensible materiality of this world: surrounded by a concrete, corporeal space, it comes across as perfectly resistant to all its physical afflictions (which concern only the tangible stuff of the symbol, without entailing its ideal content).[98] Yet withal, one of the essential functions of

to this or that type of spatial movement. Other accidental features of the toy are normally fixed and have no part in the changing process (the baby doll does not partake in the process of growth, the blush of its cheeks is frozen forever; the only change it is destined to undergo are certain 'regular' displacements, such as being laid in the 'crib', lifted from the 'crib', accepted in the arms, rocked, etc.).

97 Perhaps there should be some higher pedagogical rationale behind the fact that many toys are made of *rubber*, so that rubber somehow resembles the ὕλη κατ᾽ ἐξοχήν of the toy as such (almost a kind of πρώτη ὕλη in the world of toys). In fact, it is impossible to draw a clear line here between the trivial and non-trivial reason thereof—both can be reduced to one: pressure and wear resistance.

98 It appears to be in the *ball*, the most perfect geometrical body, that the spirit of the game achieves its most ideal objectification. The ball is also an abstraction of the heavenly orb, which is truly the proper form of the divine beings of the supralunar realm. As a classic *medium* of the game, the ball is actually devoid of a self of its own, consisting wholly of the privation of its own interior, all contained in its outer shape

the toy, seemingly paradoxically, is to encourage exactly this natural proclivity in the child to manipulate it in a deliberately inappropriate, revolutionary and iconoclastic manner. Such 'exploratory' abuse of the individual toy, to which the toy as such is as obstinately resistant as a punching bag, serves after all a clear pedagogical purpose: it shows the child that all his repeated attempts to change his toy otherwise than aright—by simply altering its position in space (which is, as we have said, the sole kind of accidental change appropriate for toys, the only option indicated in the user guide)—prove in the end perfectly illusory and unproductive. The toy thus serves not only to domesticate the wilderness of outside nature, but also, indirectly, to tame the inner wilderness of the child—that restive and recalcitrant nature that manifests itself in every young person during the process of growing up. After many thwarted and ineffective assaults on the accidental and substantial integrity of their toys (as 'things' *par excellence*), the child eventually abstains from his futile persistence[99] and gets used to the victorious tenacity of a trustworthy world ruled by the universal law of locomotor change: a simple kaleidoscopic change that changes nothing of substantial consequence.

(εἶδος), all outdoors and public, all intended to be someone else's, actually everyone's and nobody's—the epitome of pure otherness. Unseizable, unholdable, ever-elusive, it does not last long in anyone's hands, but glides quickly and continuously from one partner to another, connecting them all to the single unique interest of perpetuating one pure rhythmic—essentially orbital—locomotion (*re-sulting* from being tossed from one contrary—one rival player *here*—to the other *there*). The ball is thus almost entirely made out of local matter. If again the spirit of the game—and this is the spirit of pure locomotion—resides in the rules of the game, then the ball would be a concentrated symbolic representation of these rules themselves, of the very regularity of the game: the vectors and trajectories of the regular, rhythmic darting, defining the objective form of the regularity of the game as such, as pure, subjectless locomotion in and of itself. Indestructible, impenetrable, both material and immaterial, airy and imponderous, the ball is the pulsing rubber heart of the game, ever pressured, ever rebounding, the untiring tyre running unremittingly over the beaten orbits of the playing field; cf. Gadamer 1990, 111. (Compare the valuable literary treatment of the ball motif in Kafka's *Blumfeld, an elderly bachelor*, a classic account of the ineliminable and insuppressible, ever-squirming hither-and-thithering essence of the ball: a pure transcendent, 'celestial' being somehow inserted within the concrete physical spatiality of this world of ours.)

99 Largely as a result of being convinced of the parallel existence of countless other identical (serial) specimens of toys of the same type. Even a child's own copy, no matter how 'different' (i.e. connoted by a unique affection and not seldom stamped by some peculiar physical mark thereof; or again unkindly distorted and mutilated in an equally biased, affectively involved manner), does not escape the overarching conceptual provisions of the ideal type, the only properties that matter. The toy is always victorious over the child.

7. Imitating the Divine

Given that, in the case of the toy, all accidental change may virtually be reduced to locomotion, whereas alteration, as well as growth and diminution—both involving substantial change—play no effective role in the life of toys, the latter must necessarily remain beyond the realm of generation and corruption—unchangeable and eternal. Endowed with a paradoxical quality that does not allow of any alteration, a quantity that is insensitive to growth and diminution, a being that escapes generation and corruption, the toy constitutes almost a divine entity, whose entelechy is manifested primarily by an undisturbed movement in stable 'orbits' defined by the stable rules of a given game. Now where does this global suspension and neutralising of the qualitative, quantitative and substantial change—so characteristic of the ontology of the toy—actually originate from? It must at any rate somehow derive from the nature of matter, which is the sole substrate of any change. Inasmuch as matter stops supporting change of which it is supposed to be a substrate, it becomes possible to speak of a kind of functional failure and breakdown on the part of matter. In the case of toys, this inherent dysfunction and numbness is manifested at all layers of matter, with the sole exception of the one that still continues to function as an unimpaired substrate of change: and this is indeed local matter, the proper substrate of locomotion. The ontological stratification of the toy yields a characteristic image in this respect: on all the layers of matter for change—with the single exception of ὕλη τοπική—adequate matter is superseded by inadequate.

7.1 The adequacy of matter (ὕλη) is again largely due to its ability to assume the role of the potency of a form (εἶδος) which is destined to be actualised in a given substance; whereas matter's inadequacy would in

consequence rule out this ability. An unfertilised mare's egg[100]—being the

100 We are aware that by introducing the modern notion of ovular conception into the present considerations we run the risk of being accused of anachronism. According to Aristotle, the female contribution to generation consists in the production of menstrual blood (καταμήνια), understood as a kind of nutrient residue or 'leftovers' (περίττωμα, ὑπόλειμμα τῆς τροφῆς, *GA* I 18, 724b26–27) intended for the maintenance of an embryo (see esp. *GA* I 19–20). Still, in choosing elucidating examples and analogies, we are not primarily guided by scruples of historical accuracy. The present study is not historical. This is why we did not hesitate to freely replace the original Aristotelian concept of generation, for the sake of clarity, with the contemporary one, which is both scientifically justified and universally well known. What is more, however anachronistic, it is still in perfect concert with the basic metaphysical tenets of Aristotle's teaching, in which the role of the material, receptive, supporting and nourishing principle—be it menses or egg cell—typically belongs to the female contributor to the generation process: 'For as we have said, the female and male could be defined above all as principles of generation: the male as having the principle of movement and generation, the female—that of matter. [...] For by male we mean a living being which generates in another, and by female—in itself' (καθάπερ γὰρ εἴπομεν, τῆς γενέσεως ἀρχὰς ἄν τις οὐχ ἥκιστα θείη τὸ θῆλυ καὶ τὸ ἄρρεν, τὸ μὲν ἄρρεν ὡς τῆς κινήσεως καὶ τῆς γενέσεως ἔχον τὴν ἀρχήν, τὸ δὲ θῆλυ ὡς ὕλης. ... ἄρρεν μὲν γὰρ λέγομεν ζῷον τὸ εἰς ἄλλο γεννῶν, θῆλυ δὲ τὸ εἰς αὐτό, *GA* I 2, 716a4–15; cf. also I 20, 729a9–11; II 1, 732a7–9; II 3, 737a27–33). The series of emphatic rhetorical questions in *Met.* VIII 4 is quite revealing in this regard: 'For instance, what is the material cause of a man? Isn't that menstrual blood? What is the moving cause? Isn't that semen? What is the formal cause [εἶδος]? The essence [τὸ τί ἦν εἶναι]' (οἷον ἀνθρώπου τίς αἰτία ὡς ὕλη; ἆρα τὰ καταμήνια; τί δ' ὡς κινοῦν; ἆρα τὸ σπέρμα; τί δ' ὡς τὸ εἶδος; τὸ τί ἦν εἶναι, *Met.* VIII 4, 1044a34–36; cf. *GA* IV 1, 765b10–15). See Connell 2016, 101. Yet on the other hand, Aristotle certainly had a fairly detailed empirical knowledge of the reproductive function of the female egg and the direct dependence of its fertilisation on the male semen, although this knowledge, for very good reason, must have been limited solely to oviparous species (cf. typical formulations as part of the report on fish spawning: καὶ τούτων δ' [sc. τῶν ᾠῶν] οὐ γίνεται τὰ πολλὰ γόνιμα, ἀλλ' ὅσα ἂν ἐπιρράνῃ ὁ ἄρρην τῷ θορῷ· ὅταν γὰρ ἐκτέκῃ, παρεπόμενος ὁ ἄρρην ἐπιρραίνει ἐπὶ τὰ ᾠὰ τὸν θορόν, καὶ ὅσα μὲν ἂν ἐπιρρανθῇ, ἐκ πάντων γίνεται ἰχθύδια, ἐκ δὲ τῶν ἄλλων ὅπως ἂν τύχῃ, *HA* VI 13, 567b3–7; ὅσα δ' ἂν τῷ θορῷ μιχθῇ τῶν ᾠῶν ..., VI 14, 568b2; ὅσων δ' ἂν ᾠῶν ὁ θορὸς μὴ θίγῃ, ... ἀχρεῖον τὸ ᾠὸν τοῦτο καὶ ἄγονόν ἐστιν, VI 14, 568b6–8; ὅταν δὲ μιγῇ τῷ ᾠῷ ὁ θορός ..., VI 14, 568b11; λαμβάνει δ' αὔξησιν τὰ ᾠά, ὧν ἂν ἐπιψαύσῃ ὁ θορός, VI 14, 568b20–21; *GA* I 21, 730a19–21; on bird's egg fertilisation: *GA* I 21, 730a4 ff.). However, a clear awareness of the functional analogy of avian eggs and fish spawn with the ova of viviparous animals and man (which ancient anatomy managed to locate in the female body shortly after Aristotle's research; see Soranus, *Gyn.* I 12, 9.10–23 Ilberg, and Galen, *De sem.* II 1, 146.20–148.16 De Lacy, the latter relating to the pioneering findings of Herophilus of Chalcedon [c. 325–c. 255 BC]; cf. Staden 1989, 165–69, 296–99) would only be an achievement of modern science. It is typically epitomised by the programmatic dictum 'Ex ovo omnia', inscribed on the frontispiece of William Harvey's (1578–1657) *Exercitationes de generatione animalium* (1651), a treatise in which the new doctrine was to receive its first clear and

pure potency of an equine form (present in it latently)—would hence constitute adequate matter, viz. a true substrate of generation (and therefore of growth and of all possible alterations as well as of a particular type of locomotion) of an individual instance of the horse species. So it provides the best warrant that, if exposed to proper fertilisation, it—the egg—will be actualised as a real flesh and bone specimen of the horse species (and not perhaps as some other substance). On the other hand, a piece of untreated wood, plastic or plush will in no way constitute an adequate substrate for generation (or for growth, alteration, or even for locomotion) of a full-blown specimen of the horse species: this kind of stuff simply does not dispose of the needed potentiality of the horse's form (εἶδος), the horse in potentia that would be latently contained within it.[101] There is in-

consistent formulation (cf. *Exerc.* 1: *Nos autem asserimus ... omnia omnino animalia, etiam vivipara, atque hominem adeo ipsum ex ovo progigni, primosque eorum conceptus, e quibus foetus fiunt, ova quaedam esse*, Harvey 1651, 2). Even so, the mammalian egg was not actually discovered until 1827 by Karl Ernst von Baer (1792–1876). See below, n. 278.

101 This raises the following question: how to determine the true criterion of *adequacy* of matter? The material component in each individual thing consists in its possibility both to be and not to be (*Met.* VII 7, 1032a20–22; cf. IX 8, 1050b11–12); the latter alternative—considered either as complete or partial nonexistence (which amounts to partial existence)—is normally called a *privation* (στέρησις). In fact, it is precisely matter for generation and corruption that Aristotle specifically defines as 'the substrate now as this individual thing, now again as [the same thing] in the sense of [its own] privation' (νῦν μὲν ὑποκείμενον ὡς τόδε τι, πάλιν δ' ὑποκείμενον ὡς κατὰ στέρησιν, *Met.* VIII 1, 1042b3; cf. IX 8, 1050b16; on the difference between matter and privation, see *Phys.* I 9, 192a3–6). For instance, a disintegrated heap of stones would constitute privation of the house intended to be erected, since the stones are currently only a *part* of the future building, sheer matter, still lacking the intended shape; whereas the *whole*, the entelechy of the house, would normally imply the ultimate association of the building materials with the εἶδος of the house (for without shape, they would simply remain 'amorphous' and 'anonymous'). Disease is a privation of health, a *partial* ('poor') health which an experienced doctor knows how to restore to former integrity; and this is possible precisely because the whole of health already 'preexists' (προϋπάρχει) in that residual *part* the doctor has undertaken to resuscitate to full integrity, say, inducing body heat by friction (whereby heat can be considered both as efficient and material cause of health, the latter being in fact numerically identical to health itself, *Met.* VII 7, 1032b26–28; also VII 9, 1034a26–30; cf. Ross II 1924, 184). '[T]his ultimate residue functioning in such a way is already a part of [integral] health, and it is the same with the house, where it is the stones [sc. that occupy a similar role], and with everything else. So it follows that, as one says, nothing can come into being if nothing already preexisted. It is obvious that some part must of necessity preexist; because matter is a part: for it is matter that both inheres [in something] and becomes [something]' (τοῦτο δ' ἔσχατον καὶ τὸ ποιοῦν οὕτως μέρος ἐστὶ τῆς ὑγιείας καὶ τῆς οἰκίας, οἷον οἱ λίθοι, καὶ τῶν ἄλλων. ὥστε καθάπερ λέγεται, ἀδύνατον γενέσθαι εἰ μηθὲν

deed no such causa efficiens, no such semen that could cause a real horse to emerge out of wood, plastic or plush. None of the usual layers involved in such matters could possibly have served as a proper substrate for those (hierarchically concatenated) substantial and accidental changes allowing a real horse to become, to grow up and to supply itself with all the qualitative traits of its own species, including locomotion itself, in the fashion of a horse of flesh and bone (which is clearly a self-induced, spontaneous locomotion, as opposed to that initiated by an external cause).

προϋπάρχοι. ὅτι μὲν οὖν τι μέρος ἐξ ἀνάγκης ὑπάρξει, φανερόν· ἡ γὰρ ὕλη μέρος· ἐνυπάρχει γὰρ καὶ γίγνεται αὕτη, *Met.* VII 7, 1032b28–1033a1; the translation is based on M. Frede's emendation of the initial passage, see Frede–Patzig I 1988, 82; also Frede–Patzig II 1988, 119 ff.; cf. *Phys.* VI 6, 237b9 ff.). From this, it follows that the material substrate of the privated, potential substance (s. in potentia) and the material substrate of the integral, actuated substance (s. in actu) are numerically one and the same (and generally 'homonymous', *Met.* VII 9, 1034a22–23); the sole distinction being that of integrity, of degree of substantial completeness: for disease can be considered as a residual *part* of impaired health (viz. 'body heat'), a health reduced to a residual minimum of its own entelechy. Seen under the 'cataphatic aspect' (i.e. redefined in terms of 'partial health'), the disease reveals the ultimate dialectical consubstantiality with its opposite (τῆς γὰρ στερήσεως οὐσία ἡ οὐσία ἡ ἀντικειμένη, οἷον ὑγίεια νόσου· ἐκείνης γὰρ ἀπουσία δηλοῦται ἡ νόσος, *Met.* VII 7, 1032b3–5; see below, n. 264). Just as stones are substantially the same both before and after final immuring into the walls of a completed building (until when they were actually a preexisting *part* of it); see below, n. 287. To sum up; the property of *adequacy* that we have previously ascribed to the material substrate refers mainly to the fact that its part (= privation/potency) and its whole (= integrity/actuality) are ultimately linked by a fundamental *substantial continuity and homogeneity*: both part and whole (e.g. disintegrated heap of stones and completed house, disease and health) are basically made out of the same—equally designated—stuff: 'So it comes about in a way that health proceeds from health, and a house from a house—that which has matter from that without matter' (ὥστε συμβαίνει τρόπον τινὰ τὴν ὑγίειαν ἐξ ὑγιείας γίνεσθαι καὶ τὴν οἰκίαν ἐξ οἰκίας, τῆς ἄνευ ὕλης τὴν ἔχουσαν ὕλην, *Met.* VII 7, 1032b11–12; cf. VII 9, 1034a23–25). So the flesh and bones of the real horse, observed *in abstracto* (= as preexisting in the mare's egg), constitute an adequate privation ('part') of the integral horse substance—an adequate horse in potentia. This is why the flesh and bones of the real horse (privationally/partially preexisting in mare's egg) would be an adequate material substrate for the equine substance (and also 'homonymous' with it). On the other hand, the wood, plastic or plush of the toy horse, observed *in abstracto* (= whilst lying untreated on the shelves of the toy factory warehouse), do not constitute an adequate privation ('part') of the integral horse substance—and therefore would not be an adequate horse in potentia. For they are actually neither less than a horse nor almost or quite a horse (nor are they 'homonymous' with a horse any more than with whatever toy that might be made out of them). They are in fact completely devoid of any substantial relationship with the horse εἶδος. Thus, *qualified by an inadequate privation*, they turn out not to be an adequate material substrate for the equine substance (nor 'homonymous' with it).

7.2.1 And yet, this seed does not fall on soil that is entirely barren: and herein lies the most conspicuous peculiarity of the toy's ontology. Although not pervading all the layers of matter involved in the process of actualisation—the reason, as we have seen, lies in the ontological inadequacy, i.e. insusceptibility and stiffness of the lower strata of the toy's substance—the seed of the horse εἶδος still manages somehow to impregnate and actuate *at least* the highest of the toy's material layers, namely, that which is the most celestial and divine, farthest away from matter for generation and corruption, completely unconditioned by any lower forms of matter—itself conditioning them all and being implied by all. And this is indeed matter for locomotion, local matter, ὕλη τοπική.[102]

7.2.2 Local matter occupies the topmost position in the stratigraphic column of sensible matter (ὕλη αἰσθητή). Below it, subject to a strict logico-ontological hierarchy, the succeeding layers are stacked vertically from top to bottom: first matter for alteration (ὕλη ἀλλοιωτή), then matter for growth and diminution (ὕλη αὐξητὴ καὶ φθιτή), then finally matter for generation and corruption (ὕλη γεννητὴ καὶ φθαρτή). The conditioning is catenated, unidirectional and nonpermutable, since each 'sediment' affects the existence of the one below, while presupposing the existence of the upper layer as an indispensable logico-ontological prerequisite for its own existence. The lowest tier, embedded in the foundation of every terrestrial being, involves the simultaneous cooperation of all the layers above, beginning with the penultimate one, matter for growth and diminution, which, as we have seen, implies substantial change in the most absolute manner.[103] Similarly, growth and diminution depend on alteration,[104] this again on locomotion,[105] the last one being simultaneously the basic and

102 The term appears in fact only once (*Met.* VIII 1, 1042b6), and in two periphrastic variants: ὕλη κατὰ τόπον κινητή (VIII 4, 1044b7–8; cf. VII 10, 1036a10–11) and ὕλη ποθὲν ποί (XII 2, 1069b26).

103 Cf. *Met.* VIII 1, 1042b3–4. Every change in size implies a change in the whole of the substance, whereas a change in the whole may suffice to lead to a substantial change (cf. *GC* I 5, 321a2–3; 321a19–20; 321b14–15; see above, nn. 83 and 86). The implication is reciprocal: the ontological precondition for increased body weight (viz. newly emergent flesh) is the substantial change ('corruption') of the food that enters the body becoming substantially altered by digestion (φθαρὲν δὴ τοῦτο [= piece of food] σὰρξ γέγονεν, *GC* I 5, 322a6–7; cf. *Met.* II 2, 994b5–6).

104 Growth, being the increase of like by like, depends upon nourishment, which is the alteration of unlike into like, resulting in the addition of the assimilated mass into the rest of the substance (see *Phys.* VIII 7, 260a29–33; *GC* I 5, 321b35–322a4; *De An.* II 4, 416b31–34).

105 A thing that exerts an altering effect on another changes its own spatial distance from the thing affected, which naturally involves locomotion (*Phys*. VIII 6, 260a2–5; *GC* I

all-pervasive type of movement, underlying all the subordinate modes.[106] Whereas matters for generation, growth and alteration are always found together, constituting the changeable substantiality of the sublunary world; local matter, though affecting the rest in a most decisive manner, still retains the privilege of existing entirely independently of all its subordinates.[107] Therefore it turns out to be the genuine 'stuff' of the supralunary world of the planetary spheres, those immortal and divine, eternally rotating substances which, albeit participating in the world of sensibility, yet escape all generation and corruption normally inherent in sensible objects as such.[108]

6, 322b21 ff.). On the other hand, if all qualitative changes can be reduced to the opposition of condensation and rarefaction (πύκνωσις καὶ μάνωσις), then the principle of locomotion involved in the corresponding spatial movements of aggregation and segregation (σύγκρισις καὶ διάκρισις) of material particles is easily discernible in the background of all special types of alteration (*Phys.* VIII 7, 260b7–13), as well as of growth and diminution (260b13–14), and generation and corruption (260b12).

106 τριῶν δ᾽ οὐσῶν κινήσεων, τῆς τε κατὰ μέγεθος καὶ τῆς κατὰ πάθος καὶ τῆς κατὰ τόπον, ἣν καλοῦμεν φοράν, ταύτην ἀναγκαῖον εἶναι πρώτην. *Phys.* VIII 7, 260a26–29.

107 ὕλη τοπική is independent not only of ὕλη γεννητή (*Met.* VIII 1, 1042b4; IX 8, 1050b17; XII 2, 1069b25), but of all other matters (*Met.* VIII 4, 1044b7; IX 8, 1050b21; *Phys.* VIII 7, 260a28).

108 Being sensible, heavenly bodies are bound to contain matters for alteration and growth, since these are normally responsible for all qualitative and quantitative—viz. sensibly perceptible—properties of things. Yet at least matter for growth definitely involves matter for generation and corruption (*Met.* VIII 1, 1042b3; see *GC* I 5), that which should at any rate be completely obliterated in the supralunary realm. Generation and corruption being suspended and neutralised, the quality and quantity of celestial bodies—their sensible properties—automatically become deprived of all their inherent mutability and transformed into immutable, fixed and abiding attributes. Although being substrates of change, according to their primary function, matters for alteration and growth paradoxically cease to be capable of supporting alteration and growth, fixing the same qualitative and quantitative features once and for all eternity. Hence the qualitative and quantitative properties of heavenly bodies prove actually quite similar to those of toys: both are at the same time sensible *and* immutable/immortal. The baby doll, a peculiar variety of baby that is never born and never dies (a veritable *puer divinus*) changes neither the quality of its complexion nor the size of its limbs, remaining permanently congealed in the appearance of an infant (in fact, it is the individual specimen of a toy that is generated and subject to corruption and various qualitative and quantitative changes, while these again are changes that only affect the *separable accidents* of an individual item). Just like toys, heavenly spheres always keep the same and immutable—that is, *inseparable*—qualitative and quantitative accidents (the different colourations and 'phases' of the Moon are only apparent qualitative and quantitative changes occurring to this celestial orb; they are actually based on the succession of certain *separable accidents* pertaining to the transient properties of the 'phenomenal' Moon alone). See above, n. 95.

7.3.1 Although residing atop the column, τοπική still does not occupy the very distal position in the overall nested hierarchy of material layers. As a matter of fact, it is itself subordinate as well, being both logically and ontologically dependent on matter of a still higher order, that which avoids not only generation and corruption, but all sensibility taken as a whole and in its entirety. This is *intelligible matter* (ὕλη νοητή), that somewhat controversial ontological category, which we come across in only a few scanty and *prima facie* incoherent claims in Aristotle.[109] Though itself independent of sensible matter, and therefore—at least theoretically—of matter for locomotion as well,[110] intelligible matter virtually never occurs separately from sensible matter (which necessarily presupposes it, in consonance with the overall logic of vertical, top-down conditioning of all material stata). What, then, is intelligible matter, this, pretty oxymoronic, nonsensible, immortal, perennial, celestial component of all sensible, temporaneous and perishable things of this terrestrial world of ours?

7.3.2 The postulate of intelligible matter is commonly thought to be forced by the need to redefine the Platonic conception of *mathematical objects* in the immanentist key of Aristotelian ontology.[111] It was actually a means of sidestepping the idealistic consequence of the separate existence of the μαθηματικά ('mathematicals') as a special kind of intermediates situated in a mean between Forms and particular things.[112] Accord-

109 *Met.* VII 10, 1036a9–12; VII 11, 1037a4–5 and VIII 6, 1045a34 and 36 (cf. also V 24, 1023b1–2).

110 By escaping all kinds of change and movement, intelligible matter—if considered in abstract isolation—proves to be inherently inert and motionless. Yet it is spatially moved from the outside, actually, from below, as it were: this is accounted for by its *virtual inseparability* from local matter, which in reality never parts from its intelligible cohabitee, almost as if carrying it piggyback (see below, n. 244).

111 Cf. *Met.* XIII 2.

112 '[I]f geometry deals with objects which are accidentally sensible (although without treating them *qua* sensible), it does not follow that the mathematical sciences will deal with sensible objects, but neither with some other objects that would exist separately from these [= Platonic Forms]' (οὐκ εἰ συμβέβηκεν αἰσθητὰ εἶναι ὧν ἐστί [sc. ἡ γεωμετρία], μὴ ἔστι δ' ᾗ αἰσθητά, οὐ τῶν αἰσθητῶν ἔσονται αἱ μαθηματικαὶ ἐπιστῆμαι, οὐ μέντοι οὐδὲ παρὰ ταῦτα ἄλλων κεχωρισμένων, *Met.* XIII 3, 1078a2–5). For a different assessment of the issue, see Humphreys 2017, who has it that Aristotle's consideration of mathematical objects is chiefly motivated by methodological concerns: 'Aristotle is not concerned with presenting an alternative ontology of mathematical objects but rather emphasizes mathematical practice. He wants to explain the actual procedure of the geometer' (ibid. 200). And this would consist in using geometrical drawings as an aid to 'imaginate' geometrical objects. Yet μαθηματικά are hardly ever mentioned outside the context of the critique of Plato's theory of Intermediates, whose main problem is of course the ontological status of the latter (cf. *Met.* I 6, 4 ff.; III 1, 7; III 2, 20 ff.; III 6, 1 ff.; XI 1, 6 ff.; XIII 2).

ingly, to the extent that the objects of geometry were to be as material as other kinds of substances, it was inevitable to postulate yet another type of matter allowing geometrical beings—however unifold and single-item they may appear in terms of their ideal construction formulas (λόγοι)[113]—to prove themselves at the same time essentially manifold, i.e. numerically multiplied in countless concrete specimens of various particular circles, spheres, cubes and whatnot.[114] Since substantial priority, in Aristotle's view, lies in particular objects rather than in universals and secondary substances, the crucial role of intelligible matter would accordingly consist in a material, that is to say, *spatial* individuation and multiplication of abstract geometrical patterns,[115] which is the only way to establish a plurality of clear-cut items of the same species in the form of a concrete multiplicity of particular, numerically separated primary substances found in the non-sensible realm of mathematics. Certainly, one may think away all sensible properties from a bronze circle or sphere: their generability and corruptibility, their size and all their qualitative features as well as spatial mobility itself; still, as the last and further irreducible material residue, there will always remain at least an abstract 'thisness' and 'hereness' of a particular circle or sphere—an *individual spatial presentness* that cannot be replaced by any other, nor somehow extruded or banished out of space. Nor could it be equated with a pure ideal entity, because intelligible matter does not allow a particular geometrical object, no matter how sparingly dimensioned (or even reduced to the zero-dimensionality of a spatial point), to be ultimately identified with a pure Form. Herein lies the specific task of intelligible matter, functioning as a true mother and protectress of all spatial substantiality issuing from her womb. The ancient commentator, see-

113 ὁ δὲ λόγος ἐστὶ τοῦ καθόλου, *Met.* VII 10, 1035b34–1036a1.

114 Particular circles can be both sensible and intelligible. The latter are in fact no less *particular* than the former; all that makes the difference between them is that the intelligible circles are *those particular circles that are taken as completely devoid of sensibility*: '[...] the concrete thing, e.g. this here circle, being *one of the particular individuals, either sensible or intelligible (by intelligible circles I mean the mathematical ones, by sensible—those of bronze and wood)* [...] One matter is sensible, the other intelligible: sensible, e.g. bronze, wood and any movable matter; intelligible—that which exists in sensible objects not *qua* sensible, e.g. mathematical objects' (τοῦ δὲ συνόλου ἥδη, οἷον κύκλου τουδί, τῶν καθ᾽ ἕκαστά τινος ἢ αἰσθητοῦ ἢ νοητοῦ (λέγω δὲ νοητοὺς μὲν οἷον τοὺς μαθηματικούς, αἰσθητοὺς δὲ οἷον τοὺς χαλκοῦς καὶ τοὺς ξυλίνους) ... ὕλη δὲ ἡ μὲν αἰσθητή ἐστιν ἡ δὲ νοητή, αἰσθητὴ μὲν οἷον χαλκὸς καὶ ξύλον καὶ ὅση κινητὴ ὕλη, νοητὴ δὲ ἡ ἐν τοῖς αἰσθητοῖς ὑπάρχουσα μὴ ᾗ αἰσθητά, οἷον τὰ μαθηματικά, *Met.* VII 10, 1036a2–12; cf. VII 11, 1036b35–1037a5).

115 'the essence of the straight line, the circle, etc., viz. the principle on which it is constructed' (Ross, 1923, 158).

ing in Aristototelian ὕλη νοητή exactly *matter for spatial extension*,[116] that is to say, the *principle of individuation*,[117] does not seem to have been far off the mark.[118] For it is precisely in virtue of intelligible matter that εἶδος comes to be ultimately elicited from its pure conceptual potentiality and brought into concrete spatial extension, projected into physical space, and endowed with the character of a concrete, numerically distinct particular, occupying its own unique and inalienable share of room. As for the contribution of intelligible matter alone (ignoring for the moment the part of all the subaltern layers), εἶδος is still not specified any further except that it is simply and unqualifiedly *spatialised*, i.e. spatially extended, set in space and made in one τόδε τι, a concrete individual distinct from all other individuals of the same class, at least in that it neither occupies the same space as another, nor allows others to occupy its own (howbeit attenuated and pointlike) piece of space.

7.3.3 It also is a matter of course that nothing prevents us from linking intelligible matter, as a true principle of individuation (or simple setting in space), with other, non-geometrical, even genuine zoological, εἴδη as well.[119] The mare's egg would thus contain, along with all the habitual

116 Alexander of Aphrodisias (late 2nd–early 3rd century AD), who identifies intelligible matter with extension (διάστασις): '[F]or the extension of a circle separated from matter and contained in thought is the matter of such a circle, yet not sensible but intelligible' (ἡ γὰρ διάστασις τοῦ κύκλου, ὃν χωρίσασα ἡ διάνοια τῆς ὕλης παρ' ἑαυτῇ ἔχει, ὕλη μέν ἐστι τοῦ τοιούτου κύκλου, ἀλλ' οὐκ αἰσθητὴ ἀλλὰ νοητή, *In Metaph.* 510.3–5 Hayduck; cf. also 515.26–28). Cf. Ross II 1924, 199–200 ('practically = space', 309); Heath 1949, 214, 216, 224; Mueller 1970, 166; Jones 1983, 97.

117 The truth is that the understanding of intelligible matter as a principle of individuation is already implicitly present in Aristotle himself; see the above-quoted passage, n. 114. If it is intelligible matter *qua* intelligible that is responsible for the existence of intelligible circles *qua* intelligible, then it is intelligible matter *qua* matter that is responsible for the existence of intelligible circles *qua* individual.

118 A passage from *Met.* VIII 6, 1045a33–35, creates a problem which we will try to overcome later. See below, nn. 134, 145 and 148.

119 Nonsensible matter is inherent in *all* particular individuals, for they can all be theoretically reduced to ὕλη νοητή. There is no reason why any particular class of individual things—say, individual mathematical objects—should be a prioritised exception allegedly possessing this possibility to a greater extent than other classes (note the explanatory οἷον at *Met.* VII 10, 1036a12, implying that mathematical objects are just one of the possible instantiations of intelligible matter). Although his instances come mainly from the mathematical field (which can be explained by the overall framework of the anti-Platonic argumentation related specifically to μαθηματικά), Aristotle nowhere particularly emphasises the purported exceptionality of mathematical objects as such: 'For there will also be matter of some nonsensible things: there is, namely, a kind of [nonsensible] matter in a certain sense in everything which is not essence or form considered in itself [i.e. Platonic Form], but a particular thing' (ἔσται

layers of matter (which, viewed as a whole, constitute the pure potency

γὰρ ὕλη ἐνίων καὶ μὴ αἰσθητῶν· καὶ παντὸς γὰρ ὕλη τίς ἐστιν ὃ μή ἐστι τί ἦν εἶναι καὶ εἶδος αὐτὸ καθ᾽ αὑτὸ ἀλλὰ τόδε τι, *Met.* VII 11, 1036b35–1037a2). According to Frede, however, '[d]ie intelligible Materie [...] sind die mathematischen Gegenstände selbst, welche, wie in M 3, 1078a28–31, gesagt wird, ὑλικῶς ("nach Art der Materie") existieren' (Frede–Patzig II 1988, 196). Yet in the given connection, ὑλικῶς is in fact contrasted with ἐντελεχείᾳ, and so meant to mean not so much 'in the manner of matter' but, rather, 'potentially', as opposed to 'really', i.e. '*qua* sensible substance' (cf. *Met.* VIII 1, 1042a27–28). The aim of the Aristotelian passage Frede is referring to (= *Met.* XIII 3, 8–10, 1078a17–31) is actually to show the principled legitimacy and unproblematic nature of the common practice of scientific abstraction, understood as a *theoretical separation* of the essential attributes from what they are otherwise *practically inseparable* in actual reality—and this 'what' is indeed a τόδε τι, a particular sensible substance equipped with all manner of variable accidental attributes, normally not subject to any theory (cf. *Phys.* II 2, 193b34–35; *De An.* III 7, 431b15–16). To this end, Aristotle cites the instance of the regular practice the arithmetician and the geometrician are used to applying in their treatment of a subject such as, funnily enough, none other than—man. What is striking here is the odd circumstance of the philosopher's preferring man to cubes or spheres, the objects that would admittedly be much more naturally expected as the subject of a mathematical investigation. Be that as it may, by observing man in theoretical separation from all accidental attributes pertaining to a particular individual, the arithmetician ultimately reduces his subject matter to 'one indivisible thing, and then considers whether there is any accidental attribute of man *qua* indivisible' (ὁ δ᾽ [sc. ἀριθμητικός] ἔθετο ἓν ἀδιαίρετον, εἶτ᾽ ἐθεώρησεν εἴ τι τῷ ἀνθρώπῳ συμβέβηκεν ᾗ ἀδιαίρετος, *Met.* XIII 3, 1078a24–25); whereas the geometrician for his part 'considers man neither *qua* man nor *qua* indivisible, but *qua* solid' (ὁ δὲ γεωμέτρης οὔθ᾽ ᾗ ἄνθρωπος οὔθ᾽ ᾗ ἀδιαίρετος, ἀλλ᾽ ᾗ στερεόν, XIII 3, 1078a25–26; cf. *An. Post.* I 10, 76b1–2; also *Met.* XI 3, 1061a28–b4, where the subject of mathematical theory is supposed to be sensible things of all possible kinds, just reduced to abstract geometrical figures and numerical relations). Both methods of the 'mathematisation' of man—a sort of 'squaring the man', the latter interpreted almost as a 'tessellated cluster', a honeycomb structure assembled of different solid tiles (an operation similar to the well-known method of Cézanne and the Cubists, but not unknown even to ancient Polykleitos, not to mention Leonardo, Dürer and many other scientising artists of Renaissance and otherwise)—are in the end completely legitimate, according to Aristotle: so the subject of mathematical theory appears as those attributes of man which—albeit considered *in abstracto*, in theoretical separation from their sensible counterparts—still *fully exist* within each particular specimen of the human species 'viewed *qua* sensible'. This is why it cannot be said that such attributes are at all missing in reality: 'Therefore geometricians speak the right way, and discuss what really exists, and, yes, their objects *are* what really exists: for being can exist in two ways, either *in actu* [ἐντελεχείᾳ = *qua* sensible individual], or *materially* [ὑλικῶς = *in potentia*, i.e. *qua* theoretically separable/separated intelligible individual]' (ὥστε διὰ τοῦτο ὀρθῶς οἱ γεωμέτραι λέγουσι, καὶ περὶ ὄντων διαλέγονται, καὶ ὄντα ἐστίν· διττὸν γὰρ τὸ ὄν, τὸ μὲν ἐντελεχείᾳ τὸ δ᾽ ὑλικῶς, *Met.* XIII 3, 1078a28–31; so the isolated couple ἐντελεχείᾳ–ὑλικῶς in fact quite equals the more common ἐντελεχείᾳ–δυνάμει, ὕλη being of course the principle of δύναμις). The ὄντα treated by geometry, as is clear from Aristotle's own claim, are therefore not

of εἶδος), also that of ὕλη νοητή, the outermost 'membrane' and the first one exposed to fertilisation (the latter, for its part, to be seen in a double logico-ontological sense, that should always be regarded as 'uniquely bivalent' in the Stagirite's thought). It is therefore the intelligible matter of the equine egg which would be that specifically qualified bearer of the pure possibility of embodying the horse εἶδος in spatial extension, of transforming a universal horse (a pure potency of horse) into an individual, spatially extended specimen of the equine species. Certainly, for a generic horse, potentially contained in the intelligible matter of the mare's egg, to be duly individuated, viz. drawn forth from the ideal non-spatiality of the universal, and then projected onto the spatial extension and allotted to a particular piece of space, a corresponding causa efficiens is required (which is indeed the semen of the male parent).[120] The copulation of the efficient cause with intelligible matter—that outermost and the most exposed layer of the causa materialis—attracts the as yet potential and unex-

simply considered to be die mathematischen Gegenstände in the specific and professional sense of the respective science, for neither cube nor sphere but none other than man is chosen to serve as a representative instance of a mathematical object (i.e. the proper object of the theoretical attention of the professional arithmeticians and geometricians). Theoretically reduced and confined to essential attributes alone—that is to say, seen only ὑλικῶς—man is thus observed, from the point of view of the arithmetician, *qua* ἓν ἀδιαίρετον (an 'indivisible unit'); and again, from the point of view of the geometrician, *qua* στερεόν (a 'spatially extended object'). These two attributes are clearly nothing but the two basic facets of spatial exteriorisation we have just indicated in the course of our consideration of the main function of intelligible matter construed as the principle of individuation: indivisible unit plus spatial extension (see below, n. 215). On the other hand, observed ἐντελεχείᾳ, in the full reality of a particular, completely individualised substance, man is normally equipped—except with intelligible matter, as a basic and inalienable appurtenance allowing him to establish himself as a pure *spatially extended indivisible unit* (a purely abstractly, nonsensibly individualised τόδε τι)—also with all the other, viz. sensible, tiers of matter, which are virtually inseparable from that highest and the most divine of all matters.

Edward Hussey is one of the few who did not simply turn a blind eye to the uncomfortable fact of *man* being chosen to instantiate mathematical objects as such. He at least makes the attempt to somehow deal with this peculiar intruder into the aseptic realm of cubes and spheres: 'Minor problems remain [...] Why does Aristotle say at 1078a24–25 that *after* the separation the arithmetician "considers whatever is incidental to the man qua indivisible"? This need not imply that the arithmetician is still thinking about the man; the reference back to the man may be just a way of reminding us that the objects of arithmetic can be connected back to the actual world' (Hussey 1991, 117 n. 20, emphasis in original). Yet Aristotle might as well have chosen some less controversial memento (an ever-to-hand bronze sphere e.g. would have served the purpose quite well). Cf. Mueller 1970, 158, 164.

120 See e.g. *GA* IV 1, 765b10–15. See above, n. 100.

tended horse εἶδος into its full spatial extension, transforming it from only an ideal, merely possible and extensionless *form* (i.e. a pure logical species) into a real, spatially extended shape (μορφή, σχῆμα), which, precisely in virtue of its concrete extension, emerges as numerically distinguished from all other individual instances of the same εἶδος. Still, one must be cautious when speaking of εἶδος being already fully embodied in spatial extension, because this process has until now been realised no more than at the level of intelligible matter (as the sole authorised carrier of an individuating principle), without being completed, or even commenced, on any of the remaining, sensible layers of matter. Therefore it still appears as pretty 'geometrical', being otherwise perfectly immaterial and unqualified: an empty shape, a sheer 'ghost' imprinted in space, endowed with nothing but the bare 'thisness' and 'hereness' of a substance yet to be.

7.4.1 All the same, one must always be aware of the essential logico-ontological independence of intelligible matter in relation to all the sensible layers below: while they all entail intelligible matter, it itself remains the only layer entirely self-sufficient from the others, the only one which, at least theoretically, can subsist separately from the remainder. Pure spatial extension involves neither locomotion, nor alteration, nor growth and diminution, nor finally generation and corruption (all of them, conversely, involving spatial extension).[121] This consequently means that the pure extension, taken in itself, lacks all sensibility, change and motion, being in and of itself completely motionless, qualityless and quantityless. As for the last designation, for instance, this would mean that the pure spatial extension is not at all already quantified *per se*: it has no positive magnitude whatsoever. Observed unrelated to matter for quantity, pure extension proves *in and of itself unquantified*, i.e. lacking any determinate dimensions of its own (though not lacking its own determinate thisness and hereness of a concrete particle of space).[122] Yet, although able to subsist independently of sensible matter, and thereby of matter for quantity as well, intelligible matter never appears separately and void of any positive quantification.[123] The latter, by the way, should also never be partial and

121 If intelligible matter had not previously *taken a place* intended to serve as the birthplace of substance, the birth of substance would have nowhere to take place, so it would not have taken place anywhere.

122 Cf. *Met.* V 6, 1016b25–26.

123 Still there is a being that, according to Aristotle, can subsist in complete detachment from all sensibility, in the pure nonsensible medium of intelligible matter, characterised solely by unmoved, unqualified and unquantified extension: this is God, the unmoved mover (*Met.* XII 7, 1073a3–13). Celestial intelligences, subordinate unmoved

incomplete. Which is why the point, the line and the plane never occur outside of a solid and fully dimensioned body, the end product of their own progressive development.[124] Since only a full-size stereometric object can be considered a substance in a complete and perfect sense, everything underneath proves to be ontologically deficient and not self-sustainable. Hence the point, the line and the plane in reality only occur as *boundaries* (πέρατα) of substances, never as substances in their own right.[125]

7.4.2 What is more, intelligible matter does not in the least entail matter for substantial change either: this is why pure intelligible matter, viz. objects made out of such 'stuff' alone, such as μαθηματικά (as 'sensible things seen not *qua* sensible'),[126] emerge as entirely ungenerated and incorruptible—immortal. Insofar as they are nonetheless still somehow susceptible to decay, geometrical objects are in reality not perishable *per*

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movers in charge of conveying the divine impetus to the heavenly spheres, are likewise purely extended without further qualification and quantification (*Met.* XII 8, 1073a38). ('Unquantified extension' is a trait that later scholastics also used to ascribe to God and created spiritual substances, Schmaltz 2020, 132.) Finally, nonsensible particularity also characterises the individual soul (more precisely, its intelligible part, νοῦς) after death and separation from the body (*Met.* XII 3, 1070a24–27; *De An.* II 2, 413b26–27; III 4, 429b5; III 5, 430a22–23).

124 This is why only a solid body can have the character of a substance, see *Met.* III 5, 1002a26 (μάλιστα μὲν οὐσία τὸ σῶμα); *Met.* XIII 2, 1077a24–28; 1077a31 (ἔτι τὸ μὲν σῶμα οὐσία τίς); cf. *Met.* III 2, 997a27. Anything less than a solid (that is, a plane, a line or a point) does not meet the necessary condition of substantiality—three-dimensional solidity. Cf. also *Met.* III 1, 996a12–14; III 5, 1001b26–28.

125 The 'extremes' (ἔσχατα)—a plane, a line and a spatial point (including an arithmetical unit, μονάς, cf. *Met.* V 6, 1016b29–31)—are not substances, but boundaries (πέρατα), or divisions (διαιρέσεις, τομαί): ἔτι δὲ φαίνεται ταῦτα πάντα διαιρέσεις ὄντα τοῦ σώματος, τὸ μὲν εἰς πλάτος τὸ δ' εἰς βάθος τὸ δ' εἰς μῆκος (*Met.* III 5, 1002a18–20); ὁμοίως δὲ δῆλον ὅτι ἔχει καὶ περὶ τὰς στιγμὰς καὶ τὰς γραμμὰς καὶ τὰ ἐπίπεδα· ὁ γὰρ αὐτὸς λόγος· ἅπαντα γὰρ ὁμοίως ἢ πέρατα ἢ διαιρέσεις εἰσίν (1002b8–11); εἴ γε μὴν γραμμὰς ἢ τὰ τούτων ἐχόμενα (λέγω δὲ ἐπιφανείας τὰς πρώτας) θήσει τις ἀρχάς, ταῦτά δ' οὐκ εἰσὶν οὐσίαι χωρισταί, τομαὶ δὲ καὶ διαιρέσεις αἱ μὲν ἐπιφανειῶν αἱ δὲ σωμάτων, αἱ δὲ στιγμαὶ γραμμῶν, ἔτι δὲ πέρατα τῶν αὐτῶν τούτων· πάντα δὲ ταῦτα ἐν ἄλλοις ὑπάρχει καὶ χωριστὸν οὐδέν ἐστιν. ἔτι πῶς οὐσίαν ὑπολαβεῖν εἶναι δεῖ τοῦ ἑνὸς [= arithmetical unit, μονάς] καὶ στιγμῆς; οὐσίας μὲν γὰρ πάσης γένεσις ἔστι, στιγμῆς δ' οὐκ ἔστιν· διαίρεσις γὰρ ἡ στιγμή (*Met.* XI 2, 1060b12–19); οὔτε γὰρ οὐσίαι εἰσὶ τὰ ἔσχατα ἀλλὰ μᾶλλον πάντα ταῦτα πέρατα (XIV 3, 1090b8–9); thus points and lines are in fact 'extremes' (ἔσχατα) of matter (*GC* I 5, 320b14–16). Yet the Pythagoreans were of a different opinion: δοκεῖ δέ τισι [= Pyth.] τὰ τοῦ σώματος πέρατα, οἷον ἐπιφάνεια καὶ γραμμὴ καὶ στιγμὴ καὶ μονάς, εἶναι οὐσίαι, καὶ μᾶλλον ἢ τὸ σῶμα καὶ τὸ στερεόν (*Met.* VII 2, 1028b15–18).

126 νοητὴ δὲ [sc. ὕλη] ἡ ἐν τοῖς αἰσθητοῖς ὑπάρχουσα μὴ ᾗ αἰσθητά, οἷον τὰ μαθηματικά (*Met.* VII 10, 1036a11–12).

se, viz. given the very intelligible matter they are 'made out of', but solely in relation to matter for generation and corruption, which is only subsequently associated with them—as the lowest layer of sensible matter, on which geometricals, as we have seen, do not depend in any logico-ontological sense. Thus a bronze circle or sphere can only be destroyed in virtue of bronze as an instance of matter for generation and corruption, not regarding the pure circleness or sphereness that is materiated in bronze[127] (nor again regarding pure intelligible matter, matter for extension, the primary material substrate of spatial circle and sphere, which, seen in and of itself, avoids any change or decay).

Viewed in this light, intelligible objects turn out to be immovable, devoid of any sensible quality and quantity, ungenerated and incorruptible. At the same time, they are completely extended and set in a concrete, physical space, being made a materiated, *this particular here*, the one rightfully claiming its own concrete portion of physical space.[128]

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127 The generability and corruptibility of a bronze circle or sphere does not depend upon the fact that it is a circle or sphere but that it is from bronze, which here assumes the role of matter for generation and corruption of a bronze circle or sphere (*Met.* VIII 1, 1042b1–3); cf. above, n. 72. However, bronze considered outside of relation to the circle or sphere—as uninformed matter—is in and of itself incorruptible and ungenerable (*Phys.* I 9, 192a28; *Met.* III 4, 999b12–13); see above, n. 75.

128 A host of scholars simply take it for granted that intelligible matter cannot be anything other than the 'matter of mathematical objects' (so e.g. Heath 1949, 216; Mueller 1970, 164; Gaukroger 1980, 193; Jones 1983, 95–96; Hussey 1991, 130; White 1993, 180; Harte 1996, 287–89; Pettigrew 2009, 254–55; Humphreys 2017, 198–99), in spite of a number of passages which show in a very revealing manner that what Aristotle has in mind are not just mathematicals, but all sorts of things—in fact all sensible objects observed not *qua* sensible (that is, in theoretical abstraction; see e.g. *Met.* XI 3, 1061a28–b4; XIII 3, 1078a21–26; *Phys.* II 2, 193b34–35; cf. Annas 1976, 29; Lear 1982, 182–83).

For what, after all, are *individual mathematical objects* as such—those, that is, owing their individuality to intelligible matter as an individuating principle? What is it—*an individual circle*? Does not each individual circular object hide in its intelligible interior a certain individual nonsensible circle (or, rather, torus) as its own 'schematic armature' (κύκλος τοδί, τῶν καθ' ἕκαστά τις ἢ αἰσθητὸς ἢ νοητός, *Met.* VII 10, 1036a2–3; cf. VII 11, 1037a2–5)? Are individual items of geometrical figures located elsewhere than within the very individual things of this or that geometrical shape (see *Met.* VII 8, 1033b10; cf. Lear 1982, 176–83)? 'For Aristotle there are no geometrical solids over and above physical bodies' (Betegh–Pedriali–Pfeiffer 2013, 36). If so, there would be no principled difference between a chalk or graphite diagram drawn with the compass—and a bronze hoop or a bagel: for within a circular layer of chalk or graphite powder, or a circular piece of bronze or baked dough, one and the same mathematical object is hidden, just individuated in three particular instances, each occupying its own concrete and shut-off bit of physical space (as well as being 'infilled' with

7.5.1 Is there still some property shared equally by all layers of matter, whether intelligible or sensible? After all, they all constitute the unity of the substance, so it is but natural to assume that they all coincide in at least one common trait. 'That matter is also substance is clear: for in all the opposite changes (ἐν πάσαις ταῖς ἀντικειμέναις μεταβολαῖς) there is some substrate of changes (τὸ ὑποκείμενον ταῖς μεταβολαῖς).'[129] The quotation belongs to the context in which Aristotle sets out his programmatic catalogue of sensible matters, so there is nothing unusual in the fact that precisely ὕλη νοητή is lacking, the explicit mention of which, frankly speaking, we encounter only thrice in the whole of the *Metaphysics* (several indirect references being much less incontestable).[130] Is thus also intelligible matter—just like every sensible matter by definition—a substrate (ὑποκείμενον) underlying a certain specific type of 'opposite changes' (ἀντικείμεναι μεταβολαί)? It is difficult indeed to think of any other function that could bind together all the material stratigraphy of substance, both sensible and nonsensible alike. Thus, like all other material layers, intelligible matter would also be the substrate of a certain type of change, viz. movement from one to the other opposite point in the change process. It is known, though, that all the special types of change—alteration, growth and generation—ultimately depend on locomotion, and that each individual type of movement can eventually be reduced to just a special variety of locomotion as the movement of all movements—the movement

three different sensible 'stuffings'). In fact, there are neither especially privileged nor more or less germane instantiations of μαθηματικά: *all are equally appropriate* (any sensible substrate is good enough: be it chalk, graphite, bronze, sand, or even air, the sensible medium of a circular gesture performed with an index finger). There is thus a certain basic similarity between mathematical objects and toys (see above, n. 72). Yet the toys, unlike mathematical objects, mostly have their original counterparts in the realm of primary substances, while this is not the case with μαθηματικά, which originally only exist as secondary substances, quantitative universals (the overlap of toys and mathematicals is after all a fairly common occurrence: balls, dice and hoops are toys as primitive as dolls and teddies). Therefore *the individual circle* is always a somewhat oxymoronic entity (cf. *Met.* X 9, 1058b12–15). However that may be, the particular individuality of the circle (either sensible or 'sensible seen not *qua* sensible') depends solely upon intelligible matter (see Jones 1983, 96); hence the persuasive impression that intelligible matter is somehow in particular 'matter of mathematical objects' (cf. the typical dilemma in *Met.* VII 10, 1035a28–b3).

129 *Met.* VIII 1, 1042a32–34.

130 See above, n. 109. Two possible indirect references: ἐκ τῆς αἰσθητῆς γὰρ ὕλης ἡ συνθετὴ οὐσία. ἀλλὰ καὶ τὸ εἶδος ἐκ τῆς τοῦ εἴδους ὕλης (*Met.* V 24, 1023b1–2; cf. νοητὴ ὕλη καὶ [= 'or'] ὕλη τοῦ εἴδους, Alexander of Aphrodisias, *In Metaph.* 562.15 Hayduck); ὅλως δ' ἀπορήσειέ τις ἂν ποίας ἐστὶν ἐπιστήμης τὸ διαπορῆσαι περὶ τῆς τῶν μαθηματικῶν ὕλης (*Met.* XI 1, 1059b14–16).

par excellence.[131] On the other hand, intelligible matter does not hinge on matter for locomotion, being superior to it and completely uninfluenced either by it or by any of the remaining layers of sensible matter beneath. It does not partake in locomotion, the fact naturally implying that the postulated movement—the movement conditioned, enabled and supported by the highest and most divine of all material layers—could not have a locomotor character, or involve in any form locomotion (as all the lower layers do in one way or another). So what kind of movement is this? The existence of this specific kind would imply at least a postulate of a still higher generic concept of movement (whatever that might mean), which would comprise at least two subordinate species: locomotor and non-locomotor,[132] the former made possible by local matter and its subaltern layers (all involving locomotion); the latter again based on intelligible matter and on it alone, entirely uninfluenced by any locomotion whatsoever. Consequently being nonsensible, non-spatial and non-temporal (i.e. temporally static), this paradoxical *non-locomotor movement* appears to have no choice but to be of a purely intelligible, *logical* nature—a sort of pure 'self-movement of the concept'.[133] This conclusion brings us unexpectedly in close proximity to the most controversial of the three Aristotelian designations of intelligible matter: that which takes ὕλη νοητή as *the generic element of the concept* (λόγος, 'formula'), i.e. the genus of the common Aristotelian definition (ὅρος).[134] What kind of dynamic is at work here?

131 See above, nn. 105 and 106.

132 It is true that the category of movement in *Cat.* 14, 15a13–14 does not include any other than the three mentioned types of accidental changes (locomotion, alteration, growth and diminution) with which the *Categories* associate a substantial change, treated here as a type of movement. All of them, in one way or another, can be reduced to locomotor movement. Such a summum genus, however, would exclude intelligible matter from the sphere of motion, thus depriving it of all dynamicity (not just the locomotor), which would of course be at odds with the very notion of matter as a basal agent of change.

133 All but in the sense of the Hegelian Bewegung des Begriffs!

134 '[F]or instance, the circle is a plane figure' (οἷον ὁ κύκλος σχῆμα ἐπίπεδον, *Met.* VIII 6, 1045a35). This is an instance by which Aristotle exemplifies his peculiarly limited and incomplete designation of intelligible matter as the generic element in a definition (cf. Alexander of Aphrodisias, *In Metaph.* 562.14–17 Hayduck; see Ross II 1924, 238). The 'plane figure' in the above example would therefore be the intelligible matter of the circle, the genus proximum of the definition of the circle (while its apparent specific difference would undoubtedly read somewhat to the effect of 'given by the set of all the points that are equidistant from a given point', cf. *Met.* VII 8, 1033b14: σφαῖρα τὸ ἐκ τοῦ μέσου σχῆμα ἴσον—it is interesting that differentia is understood elsewhere as a kind of quality, so the 'quality' of a circle would be its 'anglelessness': κύκλος ποιόν τι σχῆμα ὅτι ἀγώνιον, ὡς τῆς διαφορᾶς τῆς κατὰ τὴν οὐσίαν

7.5.2 According to Aristotle, each movement is essentially a passage from one opposite determination to another (intermediaries included). If based on some of the layers of sensible matter, such a passage has the character of alternation of the *contrary* attributes replacing the previous ones and taking their place in turn: so e.g. a thing's hereness succeeds its own thereness replacing it by virtue of a simple locomotor movement of a thing from there to here; health ousts disease and takes its place after the patient has healed; the same goes also for the relative size of a thing that increases from small to large, largeness taking the place previously occupied by smallness. Unlike accidental change, as we know, substantial change (though actually not to be taken for movement proper) is *contradictory* in nature: existence supersedes nonexistence and occupies its place; while nonexistence in turn crowds out its opposite, existence, both constantly resting on one and the same material substrate of a particular thing now coming into being, now ceasing to be.

Since it is, like all other kinds of matter, ultimately a substratic, potentialising element of a thing, intelligible matter would itself serve to establish a premise for yet another particular kind of movement, a passage from one opposite determination to another. In view of the fact of intelligible matter assuming the role of the generic element in a definition, such a passage turns out to be of a purely 'dialectical' nature, the one, namely, involving the chain of opposing pairs of self-generated and self-posited classes (the opposite branches on the 'Porphyrian tree')—always substratically undergirded, underlain and conditioned by the intelligible matter *qua* genus of the logical definition. Such a process of 'opposite changes' therefore proves to be nothing other than a notorious process of *logical division*[135]—a purely logical (that is to say, non-locomotor, non-spatial, non-temporal) movement of passing from one contrary term[136] to another (the former of which then pushing the adversary and in consequence 'occupy-

ποιότητος οὔσης, *Met.* V 14, 1020a35–b1). On genus as a matter (ὕλη) of definition, see *Phys.* II 9, 200b7–8; *Met.* V 6, 1016a26–28; V 24, 1023b2; V 28, 1024b8–9; VII 7, 1033a4 (to be obelised as a gloss, according to Ross II 1924, 186); VII 12, 1038a5–9; X 8, 1058a23–24. Cf. Jones 1983, 98–99.

135 It should be noted that the Aristotelian God—although himself immobile in a locomotor sense (τὸ πρῶτον κινοῦν ἀκίνητον αὐτό, *Met.* IV 8, 1012b31)—is actually incessantly moved in this intelligible, logical sense. He is in fact nothing other than the very incessant movement of thought out of its own inherent drive: a thought that unremittingly thinks itself (νόησις νοήσεως, *Met.* XII 9, 1074b33–35), a sort of infinite logical division (of permanent cosmic consequences).

136 'Contraries are called [...] the terms that differ the most within the same genus' (ἐναντία λέγεται ... τὰ πλεῖστον διαφέροντα τῶν ἐν τῷ αὐτῷ γένει, *Met.* V 10, 1018a25–28; X 4, 1055a27–29; X 8, 1058a9–16). They are in fact more properly specified as 'contradictory coordinated' (conceptus coordinati disiuncti).

ing his place'), and so forth—down to the lowest member, the ultimate 'formula' (λόγος) of the substance, wherewith the process of specification eventually comes to a halt.[137] Thus e.g. the generic term (genus remotum) 'body' divides into a pair of mutually exclusive sub-classes 'animate' and 'inanimate', whereupon the 'animate' supersedes the 'inanimate'[138] establishing the subaltern species 'animal'; this one, taking on the capacity of genus (proximum), further splits into a new pair of contraries, 'rational' and 'irrational', of which the 'rational' dismisses the 'irrational', eventually establishing the infima species 'human'.[139] The whole process of 'opposite changes' is—let us emphasise it once more—made possible precisely by intelligible matter as a generic element inherently present and decisively conditioning at all levels of division, down to the lowest one, the infima species (τὸ ἔσχατον).[140] Since each lower species, once installed, takes on the role of the new genus,[141] intelligible matter (*qua* genus) presents itself

137 '[F]or it is in the course of division and in the intermediate levels that contrarieties come about, until we reach the individuals [= ἄτομα, i.e. indivisible species]' (ἐν γὰρ τῇ διαιρέσει καὶ ἐν τοῖς μεταξὺ γίγνονται ἐναντιώσεις πρὶν εἰς τὰ ἄτομα ἐλθεῖν, *Met.* X 8, 1058a19–21). On definition by division, see *An. Post.* II 13 (ὅρος διὰ τῶν διαιρέσεων, 97a23) and *Met.* VII 12, 5–12 (οἱ κατὰ τὰς διαιρέσεις ὁρισμοί, 1037b28–29). Division is a mandatory prerequisite for a normal genus-differentia definition: 'It is necessary [...] to divide the genus into the individuals which are the first [= lowest] in species [...] and then try to undertake their definitions' (χρὴ δέ ... διελεῖν τὸ γένος εἰς τὰ ἄτομα τῷ εἴδει τὰ πρῶτα ... εἶθ' οὕτως ἐκείνων ὁρισμοὺς πειρᾶσθαι λαμβάνειν, *An. Post.* II 13, 96b15–18; cf. *Met.* VII 12, 1038a17–18); 'For if everything [sc. that is defined] consists of two [= genus and differentia]—and if *animal–mild* is certain one thing [= genus], and if, again, it is of this [= i.e. of the genus *mild animal*] and the differentia [= i.e. *two-footed*] that a *man*, or whatever else which becomes one thing, consists—then this [sc. pair of terms] must necessarily be postulated by [previous] division' (εἰ γὰρ ἅπαν ἐκ δύο ἐστί, καὶ ἕν τι τὸ ζῷον ἥμερον, καὶ πάλιν ἐκ τούτου καὶ τῆς διαφορᾶς ὁ ἄνθρωπος ἢ ὅ τι δήποτ' ἐστὶ τὸ ἓν γινόμενον, ἀναγκαῖον διελόμενον αἰτεῖσθαι, *An. Post.* II 13, 96b32–35).

138 Just as e.g. matter for alteration makes it possible to pass from one qualitative determination to its contrary, which then removes it and takes its place.

139 'Each time that one assumes opposites and differentia, and that everything falls into this and that, and assumes that what is sought is in one of these two, and comprehends it, [...] it is evident that if, by advancing in this way, one reaches those terms which no longer have any differentia, one will obtain the formula of the substance' (εἶτα ὅταν λάβῃ τἀντικείμενα καὶ τὴν διαφορὰν καὶ ὅτι πᾶν ἐμπίπτει ἐνταῦθα ἢ ἐνταῦθα, καὶ λάβῃ ἐν θατέρῳ τὸ ζητούμενον εἶναι, καὶ τοῦτο γινώσκῃ, ... φανερὸν γὰρ ὅτι ἂν οὕτω βαδίζων ἔλθῃ εἰς ταῦτα ὧν μηκέτι ἔστι διαφορά, ἕξει τὸν λόγον τῆς οὐσίας, *An. Post.* II 13, 97a14–19).

140 See below, nn. 150 and 273.

141 'Also the intermediate [i.e. subaltern] terms, taken together with the differentiae, will be genera, all the way down to individuals' (ἔτι καὶ τὰ μεταξὺ συλλαμβανόμενα μετὰ τῶν διαφορῶν ἔσται γένη μέχρι τῶν ἀτόμων, *Met.* III 3, 998b28–29).

as a logical constant, the red thread of the division process, straight from its beginning, the category[142] (genus generalissimum), until the end, the most specified species (species specialissima).[143] So it is by way of intelligible matter that the species reaches its full development under the form of the immanent definition, the *completely matured* logical potentiality of a thing-to-be, the fully defined species potentialiter.[144]

Yet intelligible matter is, as we have seen, the factor of still another type of change: the change from the species potentialiter to the species actualiter, from thing-to-be to thing-that-is. Due to intelligible matter, the still non-spatial εἶδος (once fully ripened into the infima species) finds its way out into space, passes from non-spatiality to spatiality, and starts to participate in the concrete spatial extension of the physical world.

7.6 How can we connect logical with ontological movement, a movement of a pure *logical specification* with that of a concrete *ontological individuation*: a physical emergence from non-spatiality into spatial extension? Although both types of movement should at any rate depend on a single

142 '[C]ontraries which differ in species and not in genus are in the same line of predication [i.e. category]' (ἐν τῇ αὐτῇ συστοιχίᾳ πάντα τὰ ἐναντία τῆς κατηγορίας, ὅσα εἴδει διάφορα καὶ μὴ γένει, *Met.* X 8, 1058a13–14; cf. X 3, 1054b34–1055a2; V 6, 1016b33–34).

143 *Genus generalissimum* and *species specialissima* are medieval renditions of the Porphyrian technical words: ἔστιν δὲ γενικώτατον μέν, ὑπὲρ ὃ οὐκ ἂν εἴη ἄλλο ἐπαναβεβηκὸς γένος, εἰδικώτατον δέ, μεθ' ὃ οὐκ ἂν εἴη ἄλλο ὑποβεβηκὸς εἶδος (Porphyry, *Isag.* 4.16–18 Busse). The terms are ultimately of Stoic origin, yet what the latter means to the Stoics is in fact the particular individual, and not the infima species (cf. *SVF* III, 214.31–33 Arnim = Diogenes Laertius, VII 61 [511.256–257 Dorandi]: εἰδικώτατον δέ ἐστιν ὃ εἶδος ὂν εἶδος οὐκ ἔχει, ὥσπερ ὁ Σωκράτης). On which ambiguity, see below, n. 150.

144 By the process of immanent logical division, matter becomes logically articulated within itself as the completely *specified potentiality* of a thing-to-be. '[W]hat is potential in the utmost sense is always the ultimate term [sc. of the specification process]' (ἀεὶ ἐκεῖνο δυνάμει ἁπλῶς τὸ ὕστερόν ἐστιν, *Met.* IX 7, 1049a21–22). The heap of stones, bricks and wood is thereby articulated into a fully specified, matured potentiality of the house, a house in potentia, a house-to-be (i.e. a bearer of a fully defined infima species 'house'); whereas before, it was merely a disintegrated heap of stones, bricks and wood lacking any internal cohesion, devoid of even remotely specified potentiality. This heap was still far from being a house in potentia (it did not contain an articulated, logically derived and defined infima species 'house'). This was also reflected in the fact that such a heap had no unique name, but was referred to with an equally random set of several distinct and unrelated names, such as 'stones', 'bricks', 'wood', etc., a state of affairs that did not oblige anyone to consider the present heap under the aspect of a potential unity (i.e. in terms of a unique species, see below, n. 267). See *Met.* IX 7, 1049a18–b2.

substantial layer of intelligible matter, this is nevertheless understood in two different senses that are *prima facie* fairly impossible to harmonise.

One of the most original solutions to this perhaps insoluble problem, bequeathed by the Stagirite to future generations of commentators, was offered by Sir David Ross, one amongst the luminaries of the modern Aristotelian exegesis. Ross' solution appears as simple as it is convincing (within the limitations of the inherent difficulties). Should we not be inclined to bracket the passage in Book H as entirely inconsistent with the other two sections concerning the same issue, the logical nexus between intelligible matter as the generic element in a definition and intelligible matter as the principle of individuation can only be established by the bold conceptual bridging propounded by the British scholar: 'If we are right in connecting the two uses, ὕλη νοητή in its widest conception is the thinkable generic element which is involved both in species and in individuals, and of which they are specifications and individualizations.'[145] So, accord-

145 Ross II 1924, 200; see also 238 (with reference to *Met.* V 28, 1024b9, VII 12, 1038a6 and X 8, 1058a23, the loci where genus is more or less explicitly designated as a substrate or matter of definition by division, all to be related to VIII 6, 1045a33–35). For recent criticism of Ross' interpretation, see Thorp 2010, 3. Yet Thorp's imputation on Ross of the alleged treatment of intelligible matter as 'that which gets individuated', rather than 'the individuating agent', is hardly borne out by Ross' context (where the phrase 'of which'—meaning 'of intelligible matter'—sufficiently clearly connotes a cause, a causa materialis, and not an object of specifications and individualisations). Intelligible matter would therefore be precisely that outermost bifunctional layer of matter which *makes possible both logical and spatial definition of εἶδος* (regardless of the possibility of εἶδος' realisation also at the level of the remaining, sensible layers of matter, which can, at least in theory, be missing as well). So, considered as ὑποκείμενον ταῖς μεταβολαῖς (in line with *Met*. VIII 1, 7–8), intelligible matter, as yet another material layer of substance, would consequently be 'something that underlies' yet another specific type of 'opposite change' (ἀντικειμένη ἀντιβολή): *the change in respect of being logically and spatially defined*. Due to intelligible matter, that is, 'something is now undefined (ἀόριστον, ἄπειρον), then again defined (ὁρισμένον, πεπερασμένον)'. (The same continuous rhythm of opposite change would also include all the opposing intermediate stages progressing between the extremes of perfect logical undefinedness of a category and perfect spatial definition of an individual solid; on which more in what follows.) Therefore it is not the bronze which is individuated by the circle, but the circle that is individuated by the bronze: and that precisely because it is *made out of bronze* as its own material cause, its own individuating agent. Now just as the bronze circle is not bronze, but 'made of bronze' (χαλκοῦς κύκλος, *Met*. VII 7, 1033a2 ff.; VII 8, 1033b24–26; cf. *Met.* IX 7, 1049a18–b2; *Phys.* I 7, 190a25–26; VII 3, 245b9–12); so too the intelligible circle is not intelligible matter, but 'made of intelligible matter' (νοητὸς κύκλος), that is to say, a spatially defined and individuated, haecceitised circle, a *this here* circle (ὅδε ὁ κύκλος). Or, in Ross' words, '[t]he form is a "such", not a "this"; in making, a "this such" is made out of a "this"' (Ross II 1924, 187), that is to say, of matter, of material cause (and, more precisely, of intelligible matter, a material layer specifically responsible for hecceitisation).

ing to Ross, there is actually just one and one alone, and that a *unique logico-ontological division* inherent in the very nature of intelligible matter as a principle of both specification and individuation alike. Such a shortcut solution otherwise seems to most elegantly meet the unique and typically indivisible *logico-ontological* essence of Aristotle's thought in its systemic entirety: by emphasising the essential inseparability of logical specification and ontological individuation, Ross looks at them as two tightly related (in fact consecutive) moments of the continuous and (at least theoretically) uninterrupted process of a single logico-ontological division. The end result of its first, logical stage, achieved by intelligible matter as a *logical genus inherently prone to ever further internal specifications*, would hence be the establishment of the infima species as the lowest logical unit (μονάς) incapable of further division, a kind of *a completely ripened and ovulated species* (species potentialiter) available for further logico-ontological fertilisation and eventual *conception* of an individual specimen of the given species (species actualiter, primary substance, or τόδε τι). This, hitherto only conceived, individual specimen of a species is for the moment no more than a bare logico-ontological 'zygote', a mere spatial point (στιγμή), incapable of further division.[146] Still it is through this spatial point that the infima species eventually escapes from the abstract non-spatiality of the pure concept, making an instantaneous leap out into concrete spatial extension (thereby mastering its own howsoever exiguous yet henceforth absolutely inalienable particle of space under the form of a zero-dimensional space point, an atomic unit of space, a 'protospace' as a literal *point de départ* for any further spatial development).[147] This would, then, mark

146 'Of what is indivisible with respect to quantity and *qua* quantity, that which is entirely [indivisible] and has no position is called a unit [μονάς], and that which is entirely [indivisible] and has position—a point [στιγμή]' (τὸ μὲν οὖν κατὰ τὸ ποσὸν καὶ ᾗ ποσὸν ἀδιαίρετον, τὸ μὲν πάντῃ καὶ ἄθετον λέγεται μονάς, τὸ δὲ πάντῃ καὶ θέσιν ἔχον στιγμή, *Met.* V 6, 1016b24–26; also 1016b29–31, see below, nn. 156 and 178). On the indivisibility (and the mere spatial givenness) of other geometrical beings, considered *qua* 'discrete quantities'—including the most perfect one, a solid—see below, n. 215.

147 In this tiny pulsing point, the germinal spot set amidst the fertilised egg—traditionally called 'the leaping point' (*punctum saliens*)—the zoologist Aristotle rightly recognises the embryonic form of the future *heart* (καὶ ὅσον στιγμὴ αἱματίνη ἐν τῷ λευκῷ ἡ καρδία. τοῦτο δὲ τὸ σημεῖον πηδᾷ καὶ κινεῖται ὥσπερ ἔμψυχον, *HA* VI 3, 561a11–13). On the heart as the seat of sensitive and nutritive souls in animals, see *Juv.* 3, 468b28 ff. (at 469a5–7). Again, in the case of a heap of stones, bricks and wood (instanced above, n. 144), it is the point in time at which the builder *points* (say, by extending his index finger) to the spatial point, στιγμή, the 'heart' around which the stones, bricks and wood of the previously amorphous and nameless heap will—after having been firstly named (viz. logically *specified*, unified and transformed into an ultimate logical unit, μονάς) as a 'house(-to-be)'—progressively assemble into the

the opening of a second, viz. ontological (geometrico-biological) stage of *one and the same process of division*, enabled by intelligible matter, henceforth considered a matter for spatial extension *sensu proprio*.[148]

7.7 The notorious characteristic of the infima species is its inherent inability to pursue logical division. The fact that the process of logical definition stops at the stage of the lowest species makes it the lowermost and further indivisible logical unit (μονάς),[149] the 'non plus infra' object of knowledge, and this is indeed one of the most momentous corollaries of this intrinsic limitation of the division process. It is this limitation that underpins not only the whole epistemology of the Stagirite, but the overall concept of Western science up to the present day.[150] This essen-

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well-informed and well-articulated matter of a particular fabric, the entelechy of an individual house.

148 'But in H [= 1045a33–35] it is the generic element in a definition, and therefore [...] *has no limitation to mathematical objects*' (Ross II 1924, 199, emphasis ours). The remark has huge implications, although Ross himself does not derive them (according to him, 'it is noteworthy that the instance [...] given in H is a mathematical one', ibid. 199–200; yet he does not disambiguate what is particularly noteworthy about the fact, since the Stagirite otherwise constantly calls upon geometrical examples). So, what could Aristotle mean by *objects that are not mathematical* (viz. arithmetical and geometrical both in one)? Certainly, in the first place, biological objects, the substances that, according to him, have an exemplary and privileged status, and these are man and other living beings, animals and plants (*Met.* VII 7, 1032a18–19). The 'mixed' geometrico-biological nature of intelligible matter should never be lost sight of and its scope should by no means be limited to purely 'mathematical objects' in the professional sense of the term. Thus, taken together, Ross' two premises—a) one concerning the essential coherence between the three passages expressly mentioning intelligible matter; and b) the other claiming the unlimited character of intelligible matter—lead to the unique conclusion that intelligible matter, by its essence, is *the principle of individuation present in all things without distinction*, see above, n. 128. On Jones' halfway solution, see below, n. 201.

149 See above, n. 146. Cf. e.g. *Met.* X 8, 1058a19–21.

150 '[F]or every definition and every science is of universals and not of particulars' (πᾶς γὰρ λόγος καὶ πᾶσα ἐπιστήμη τῶν καθόλου καὶ οὐ τῶν ἐσχάτων, *Met.* XI 1, 1059b25–26; cf. XI 2, 1060b20–21; see above, n. 30). Although somewhat ambiguous, τὰ ἔσχατα here can hardly be meant to mean 'infimae (ultimate) species' (as in Ross' and Tredennick's reading), for the lowest species as such can be fairly well defined and most ordinarily subjected to scientific knowledge, as evidenced by the lowest series of all scientific taxonomies (including Aristotle's own, such as e.g. those of *History of Animals*). Thus 'horse', or 'pony', or 'Exmoor pony', are the infimae species, that is, the lowest universals (τὰ ἔσχατα εἴδη, τὰ ἔσχατα κατηγορούμενα); while this horse here is a particular individual (τὸ καθ' ἕκαστον, τόδε τι), subject to experience, but not to any science (cf. *Met.* I 1, 981a15–17). As for the above quote, some scholars therefore opt for 'res individuae' (as Bonitz in *Index*, s.v. ἔσχατος ad loc.), or 'les individus' (Tricot), which is seemingly influenced by the Thomist interpretation of τὰ ἔσχατα as 'singularia' or 'particularia' (cf. *QDV*, q. 10, a. 5, co.; see Allers 1941, 106–8). Such vacillation reflects the fundamental ambivalence of τὰ ἔσχατα/ἄτομα existing in Aristotle himself ('the lowest species': *PA* I 4, 644a24; *Met.* II 2, 994b21;

tial limitation is accounted for by the fact that the infima species lacks the inner capacity to further logical differentiation: it simply falls short of assuming the role of genus at an even lower, 'subinfimal' stage of division.[151] At this lowest point, intelligible matter (seen as the generic element in a definition) loses its ability to differentiate within itself, emerging as a *bare potency of division* virtually deprived of any effective power to produce still more differentiae on its own account. Yet given that the continuity of the division process should nevertheless not be suspended, but should progress despite the intrinsic limitation of intelligible matter, it is necessary to make a certain extrinsic intervention that would somehow compensate for the lack of ability for autogenetic differentiation, thus helping intelligible matter to successfully escape the 'procedural blockage' and keep working without interruption under altered conditions as well. The force that would break the deadlock in the process of division would therefore be some outward factor providing the infima species with an essentially heterogeneous kind of differentia, one capable of converting logical differentiation into ontological, thereby allowing intelligible matter to be eventually actuated in the capacity of a true principle of individuation. The task of introducing such a heteronomous differentia at a subinfimal level of division falls upon the causa efficiens, whereas the operation of its associating with the infima species amounts to nothing other than the simple act of natural, biological copulation,[152] by which the male, seminal component—assuming the role of an extrinsic differentia[153]—attaches to

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III 3, 998b16; III 3, 999a5; XI 1, 1059b35; *EN* III 5, 1112b23; 'particulars': *Met.* III 3, 998b29; III 3, 999a12; III 3, 999a15; III 4, 999a31).

151 That is, at the stage of ὑποβεβηκὸς εἶδος, mentioned in the quotation above, n. 143 (cf. the equivalent Stoic usage of the term εἰδικώτατον εἶδος referred to there). It is characteristic that there is a clear terminological coordination there with ἐπαναβεβηκὸς γένος at the opposite end (in fact, beyond the opposite end) of the scale: both transcend the scope of the scientifically knowable. However, while the Porphyrian ὑποβεβηκὸς εἶδος is located below the lowest species, for John of Damascus there is no difference between εἰδικώτατον/ἔσχατον εἶδος and ὑποβεβηκὸς εἶδος (εἰδικώτατον δὲ εἶδος τὸ ἔσχατον καὶ ὑποβεβηκὸς εἶδος, ὅπερ εἶδος ὂν οὐκ ἔστι γένος διὰ τὸ μὴ ἔχειν ἕτερα εἴδη ἐξ αὐτοῦ τεμνόμενα, *Institutio elementaris* 23.10–12 Kotter).

152 Instead of a purely logical one up to that point. Causa efficiens thus actually comes down to *one particular kind of differentia*: the one that takes the definiendum out of the logical domain and translates it to the level of subinfimal, ontological—spatial definition.

153 Unlike the classic formula of the logical definition—*definitio fit per genus proximum et differentiam specificam*—an ontological, i.e. *spatial definition*, could be formulated to the following effect: *definitio* (sc. *ontologica seu spatialis*) *fit per infimam speciem et haecceitatem*, the lowest species assuming the capacity of a proximate genus, and haecceity that of a specific difference. If intelligible matter as such is matter for division and transition to more defined species, down to the infima species; then the copulation of intelligible matter and haecceity will result in the transition of the infima species from a non-haecceitised to a haecceitised mode of existence, from a

the female, maternal element, the genus reduced to the infima species, as one which is completely ripened and eventually ovulated into a species potentialiter.[154] The logical definition is thereby converted into the ontological, the individuation proper, the positing of concrete spatial boundaries (ὅροι) instead of the purely abstract and non-spatial ones, as hitherto, as long as the division took place within the limits of the pure logical self-unfolding of a concept. These spatial boundaries are certainly the πέρατα of things, the initial and elementary πέρας being indeed the spatial point itself, the zero-dimensional originator of all the remaining dimensions to be subsequently derived in the first next steps of the defining process.[155] This is the very bursting forth from the logical ('arithmetical') non-spati-

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pre-spatial unit to a spatial point. While intelligible matter as such enables the transition and definition, haecceity gives this transition and definition a spatial character, transforming it from logical into ontological.

154 Expressed in biological terms, the overcoming of the logico-ontological stoppage (in the process of self-differentiation) through the intervention of an external differentia, as causa efficiens of conception, looks like this: 'It is clear that the male is the principle of movement, and that the female is matter. This is why the female does not give birth on her own either: for she needs a principle, something that will move her, and something *defining* her' (ὅτι ... τὸ μὲν ἄρρεν ἀρχὴν κινήσεως, τὸ δὲ θῆλυ τὴν ὕλην, δῆλον ... διὰ γὰρ τοῦτο οὔτ' αὐτὸ καθ' αὑτὸ γεννᾷ τὸ θῆλυ· δεῖται γὰρ ἀρχῆς καὶ τοῦ κινήσοντος καὶ διοριοῦντος, *GA* I 21, 730a24–32; this definition is of course ontological or spatial). 'The same thing happens when it comes to birthing of oviparous fish. For whenever the female lays her eggs, the male besprinkles them with milt: and those eggs which are touched by it are rendered fertile, whereas those which remain intact prove infertile, since in living beings the male does not contribute in terms of quantity, but in terms of quality' (τὸ δ' αὐτὸ συμβαίνει καὶ περὶ τὴν τῶν ἰχθύων γένεσιν τῶν ᾠοτοκουμένων. ὅταν γὰρ ἀποτέκῃ τὰ ᾠὰ ἡ θήλεια, ὁ ἄρρην ἐπιρραίνει τὸν θορόν· καὶ ὧν μὲν ἂν ἐφάψηται, γόνιμα ταῦτα γίγνεται τὰ ᾠά, ὧν δ' ἂν μή, ἄγονα, ὡς οὐκ εἰς τὸ ποσὸν συμβαλλομένου τοῖς ζῴοις τοῦ ἄρρενος, ἀλλ' εἰς τὸ ποιόν, *GA* I 21, 730a18–24). Now it should be borne in mind that the primary meaning of the term 'quality' (ποιόν), as stated in the philosophical glossary of Book Δ, is nothing other than the *differentia specifica* (ποιότης διαφορὰ οὐσίας, *Met.* V 14, 1020a33–b3; also V 14, 1020b14–15); while, on the other hand, *genus* should be seen precisely as matter: '[F]or that to what the differentia and [= 'or'] quality belongs [= as the attribute thereof] is the substrate, which we call matter' (οὗ γὰρ ἡ διαφορὰ καὶ ἡ ποιότης ἐστί, τοῦτ' ἔστι τὸ ὑποκείμενον, ὃ λέγομεν ὕλην, *Met.* V 28, 1024b9–10; VII 12, 1038a6; X 8, 1058a23–24). Differentia is therefore the male contribution to the biological definition of a substance: the causa efficiens of its conception and ultimate generation. Not besprinkled with the milt of differentia, the ovulated egg of infima species (or further indivisible genus infimum, which turns out to be the same) remains unfertilised—a wind egg (ὑπηνέμιον ᾠόν, cf. e.g. *GA* II 3, 737a30–32), an undifferentiated and ultimately undefined concept stuck at the threshold of spatiality. For female as ὕλη (gently oscillating between biological and logical connotations), see *Met.* V 28, 1024a35; cf. X 8, 1058a24. Cf. above, n. 100. On the female as the contributor of genus, and the male of differentia specifica (= species in negative mode)—both equally indispensable for definition—see below, nn. 256 and 262.

155 'Aristotle considers that all spatial magnitudes can be generated from lines and points (he quotes the Pythagoreans with approval on this at *de An.* 430b20)' (Gaukroger 1980, 189).

ality of the infima species (species potentialiter, μονάς) into the ontological ('geometrical' or, rather, 'geometrico-biological') spatiality of the individual, the τόδε τι (species actualiter, στιγμή),[156] a sudden leap towards the ontological stage of division as a concrete spatial split into 'this' and 'that'. So it is in virtue of the division of the infima species 'human' that Socrates once emerged as 'this one' as opposed to 'that one'—the latter including whatever individual member of the class 'human' not occupying a portion of the spatial extension allotted to Socrates alone,[157] each non-Socrates, each Callias who has ever existed or will someday exist.[158]

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156 '[T]hat which is in no way divisible with respect to quantity is a point and a unit: when it has no position—a unit, and when it has position—a point' (τὸ δὲ μηδαμῇ διαιρετὸν κατὰ τὸ ποσὸν στιγμὴ καὶ μονάς, ἡ μὲν ἄθετος μονὰς, ἡ δὲ θετὸς στιγμή, *Met.* V 6, 1016b29–31; also 1016b24–26; cf. XIII 8, 1084b26–27; *An. Post.* I 27, 87a36). See above, n. 146, and below, n. 178.

157 That is, a fully dimensioned Socrates, one that is not just reduced to the initial zero dimension of the spatial point, the human στιγμή located in the egg of Phaenarete once fertilised by the sperm of Sophroniscus. For the pointlike precursor of Socrates indwelling in the zygote in his mother's womb (*punctum saliens*, see above, n. 147) is still neither a fully dimensioned nor a fully substantialised Socrates (see below, n. 177). Nonetheless, there is a particular portion of space (subsequently to be expanded to the full range of the remaining three dimensions) that will no longer separate from Socrates until the very moment of his death, being from now on an absolutely indispensable material component of his substantiality—his intelligible matter, or matter for spatial extension. (The personal *genius*, which the Romans used to conceive of as the inalienable tutelary spirit of each individual until his death, is in its deepest essence always a *genius loci—a lifelong inalienable spirit of individual spatial extension*.) It should also be emphasised that the initial naught degree of spatial extension is common both to Socrates (as a representative of the organic world) and to artificial substances such as the house (mentioned above, nn. 144 and 147). The ontological status of the pointlike precursor of Socrates spatially embedded in the fecundated egg of his mother, and the pointlike house foundation, 'templum' laid in particular spatial surroundings by a decretory 'fiat' of the index finger of a builder, both prove to be of the same kind, from the ontological point of view. Such is the inevitable consequence arising from the overall nature of Aristotle's philosophy, which effaces any essential difference between conception in the organic medium of an animal or vegetable germ, and the inorganic milieu of a human artifact.

Incidentally, since intervention of the efficient cause may just as well be lacking (see above, n. 154), ovulation could also be rendered nugatory: just as many an ovulated human egg remains unexposed to the fertilising effects of human sperm, and is therefore denied the opportunity of conceiving an individual specimen of man, so likewise many an ovulated heap of bricks remains unexposed to the fertilising effects of a builder's volition to make efficient use of it for the purpose of constructing, and is therefore denied the opportunity of conceiving an individual specimen of house (see below, n. 268).

158 What is the concrete content of the differentia by which a τόδε τι, this here Socrates, is educed and emancipated from the infima species 'human', to be fully released into a particular spatial extension of his own? It is a pure haecceity, the pure thisness and

7.8.1 With the establishment of a spatial point, the first seminal rudiment of a new individual instance of intelligible matter surfaces in physical space, being a kind of most minute and most attenuated embryonic germ of a future substance (e.g. Socrates at the moment when he is no more than an individual pointlike item of pure intelligible matter, characterised only by the elementary spatial extension of dimension naught).[159] Anyway, it should never be forgotten that going out into the realm of spatial extension is not the same as going out into the realm of sensibility. Space is not sensible *per se*, nor is it that which caters for the attributes of sensibility. It is just a pure extension, the simple state of being individuated, numerically distinguished, and nothing more than that. Only the substances occupying space can be sensible, not the space itself. Yet they—the substances within space—might, according to Aristotle, just as well be nonsensible, which clearly indicates that spatial extension and sensibility are two essentially distinct things, that may certainly coincide, but do not

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hereness of Socrates (see above, n. 153), contained in the semen of Socrates' father Sophroniscus (see the previous note). At any rate, a pure haecceity of Socrates should not be confounded with the individual Socrates and simply equated with him: for Socrates the individual is defined not only by his thisness and hereness but also by 'humanity', the quasi-genus of Socrates' ontological definition, common to Callias, Coriscus, et al. Such a quasi-genus is again contained in the egg of Socrates' mother Phaenarete, in a ripened and ovulated, that is to say, fully evolved infima species (= genus infimum) 'human', the future 'humanity' of a once completely actualised Socrates (otherwise common to all humans as humans; for, theoretically speaking, Phaenarete could couple with any human of any time, and what she would bring into the world would always be a human, a specimen of the human race—of ἀνθρώπινον γένος). Only the pure haecceity (in the capacity of a differentia specifica) originating from Sophroniscus (causa efficiens), copulated with overall 'manness' (in the capacity of a genus proximum) originating from Phaenarete (causa materialis), succeeded at least in defining Socrates as a) *a human* (that is, infima species in the capacity of a new proximate genus) *which is* b) *this here* (that is, characterised by thisness and hereness in the capacity of a new specific difference). Such a definition has an ontological, spatial character, because it defines not an abstract logical formula (λόγος) but a real individual specimen of the species 'human' occupying a concrete, this here portion of physical space. The function of an ontological definition is therefore in fact *poietic*, not *epistemic*, as in the case of a simple logical definition (cf. *EN* VI 3–4). So the process of defining (ὁρίζειν, ὁρισμός) here brings us back to the original, etymological sense of *being provided by concrete spatial, bodily boundaries*, or *being moulded into a concrete stereometric shape* (σχῆμα, μορφή = spatialised εἶδος). A trace of this original meaning is stored in locutions such as 'well-defined body', 'body definition' and the like (the latter being typically ambiguous in this regard: καὶ ὁ ὁρισμὸς πλεοναχῶς λέγεται, *Met.* VII 4, 1030a17–18).

159 So far without any of the remaining, sensible layers of matter, which will eventually constitute the entelechy of an accomplished Socrates.

do so necessarily.[160] It is important to note that such an individual item of pure intelligible matter, a spatial point,[161] is only the tiniest precursor of a substance, which does not yet have the character of substance *sensu proprio*. This pointlike substance, although *conceived* (i.e. having taken the form of a zygote), has not yet been really *generated* and come into existence, being so far merely 'given' in a geometrical, or, rather, a geometrico-biological, sense of the term. Being such, it is characterised above all by that basic and most eminent property of intelligible matter: its ability to *divide*. We have seen that before conception and exit into space, this inherent divisibility of intelligible matter[162] had the character of a logical specification. At some point (aided by causa efficiens, as a sort of extrinsic catalyst for further division), it acquired the character of ontological individuation, allowing a matured and ovulated infima species—the indivisible logical unit, μονάς—to be fertilised and eventually leap out into space under the form of an embryonic germ of a new substance—the indivisible spatial point, στιγμή. However, the division process is not completed by the simple positing of a στιγμή, a geometrico-biological zygote. It will also continue, at an unabated pace, when the species has already entered the province of spatial extension (μονάς being turned into στιγμή). At any rate, it is important to bear in mind that this new stage of division—following the basic and unstoppable momentum derived from the nature

160 As in the case of particular bronze circles, which are both sensible and nonsensible, the latter existing in the sensible ones, yet not *qua* sensible (*Met.* VII 10, 1036a2–12; see above, n. 114). *Qua* pure solids, the nonsensible circles have their particular share in concrete physical space, yet not also in its sensible, this-worldly content. Although only theoretically and potentially (ὑλικῶς) separable from the bronze circles, they are as real as sensible circles (cf. *Met.* XIII 3, 1078a28–31), with which they coincide in numerically the same portion of physical space (see below, n. 210).

161 Emily Katz misses the point by claiming 'that mathematical points and units have no intelligible matter, as they are among the things that are "by [their] nature a kind of unity", and Aristotle states that such things "have no matter, either for reason or for sense" (*Metaph.* H.6, 1045a36–b1)' (Katz 2019, 507–8). What Aristotle has in mind here are in fact *the categories*, not the mathematical points and units, which are not alluded to anywhere in the given context. Again, it is sufficiently clear why categories cannot have intelligible matter: being the highest genera (= the highest 'units' of substance, quality and quantity, VIII 6, 1045b1–2), they cannot have any genus—any intelligible matter—above themselves. That is why the categories as such elude the competence of intelligible matter (i.e. the possibility of being themselves defined). The categories cannot *have* intelligible matter because they *are* intelligible matter (being themselves the extreme 'upper end' of the logical half of its 'spectrum'). See Ross II 1924, 238 ad loc.

162 In the sense of its inherent *potential to galvanise division*, not itself to be divided (see above, n. 145).

of intelligible matter as such—still takes place outside (actually 'in front of') the sphere of sensibility and without any contact with the remaining, lower layers of matter (also including matter for growth and diminution), in the pure pre-sensible area of intelligible matter in and of itself. This stage in the history of the creation of a substance could be referred to as a stage of pure geometrical, or, rather, geometrico-biological, *conception*,[163]

163 A sort of 'transcendental construction' of a pure geometrical form in compliance with an algorithm inherent in the very nature of intelligible matter as such (namely, the overall rule of division). Intelligible matter therefore appears—in view of the rather specific and crucial role assigned to it in the process of constituting the real objects of the sensible world (primary substances)—as a kind of distant announcement of Kant's 'transcendental schema', given the central and mediating role of the latter in the overall 'constitution of experience'.

The classic Kantian definition, namely, reads as follows: 'Now it is clear that there must be a third thing, which must stand in homogeneity with the category on the one hand and the appearance on the other, and makes possible the application of the former to the latter. This mediating representation must be pure (without anything empirical) and yet *intellectual* on the one hand and *sensible* on the other. Such a representation is the *transcendental schema*' (Kant 1998, 272 = *KrV*, A 138/B 177, emphasis in original).

Yet there the similarity ends. Kant's schematism rests on the intermediary role of 'inner sense'—time being its pure form; whereas time, in turn, is what essentially conditions space, itself understood as the pure form of 'outer sense': 'Space, as the pure form of all outer intuitions, is limited as an *a priori* condition merely to outer intuitions. [...] so time is an *a priori* condition of all appearance in general, and indeed the immediate condition of the inner intuition (of our souls), and thereby also the mediate condition of outer appearances' (ibid. 180–81 = *KrV*, A 34/B 50–51). So the Königsbergian philosopher. On the other hand, though, the intelligible matter of the Stagirite, as we have seen, proves to be a matter for spatial expanse, which does not in itself involve time, nor is it in any way conditioned by time. As a 'number of locomotion', Aristotelian time is the proper responsibility of local matter, which is the first subsidiary layer of substance, placed immediately underneath the uppermost, the intelligible. While time for Kant is by and large functionally superior to space (and more immediately attached to a category—indeed via 'imagination'), with Aristotle it is quite the opposite: his intelligible matter, as matter for spatial externalisation (which is immediately preceded by an exhaustive division of a category), is ontologically prior to local matter, as matter for movement and temporality—so Aristotle's space does not depend on time, but conversely, his time ultimately depends on space (and only via space—on the category; while Aristotle's category is already endowed with its own intrinsic capacity for an automatic, self-induced 'imagination'—an autogenous *eidopoietic* mobility of logical division, as a sort of 'gravitational inertia' of self-specification, already inherent in a category as such).

Consequently, the Aristotelian εἶδος—both objectively (= extramentally) spatialised and nonsensible (underlain by intelligible matter only)—retains its traditional metaphysical status (= of 'thing-in-itself'); whereas the notion of the 'transcendental', in the way we employ it in the present context, keeps its traditional and unspecified,

and it would extend from the moment of positing the spatial point, until the emergence of the pure three-dimensional solid. With the completion of a mathematical solid, all the crucial pre-sensible (transcendental) conditions for the establishment of a sensible substance are fulfilled, given that the substance as a concrete particular supposes at least three-dimensional, stereometric solidity, whereas anything less than a solid turns out to be insufficient to meet the necessary condition for the generation of a substance and its final release into the full-bodied sensibility of a τόδε τι. For it is solely by establishing itself as a solid that the substance becomes at last ready to absorb the remaining layers of matter, starting from the locomotor layer, as the first beneath intelligible matter, down to the undermost and last among sensible matters, that for generation, to which the substance owes its very coming into existence, its first emergence into this world.[164] So let us first examine the nature of this initial phase of the interior division that brings the spatial point, the logico-biological zygote, step by step to the degree of a three-dimensional solid, thus allowing it to eventually penetrate within the sphere of sensible matter and be born under the form of an individual specimen of a concrete this-worldly object of sense.

7.8.2 This is of course a kind of *quantification* which, paradoxically though it may appear at first sight, in no way involves matter for growth and diminution, since the latter belongs to the sensible layers, while the process in question is supposed to take place in the sphere of purely intel-

'scholastic' meaning (= 'transcendent', meaning: objective-cum-nonsensible). Thus, observed by itself, εἶδος (as a pure solid, a three-dimensional schema) turns out to be an objective, spatial, concrete, this-here, and simultaneously nonsensible and 'transcendental' (i.e. transcendent, extramental), as well as completely *extratemporal*, precursor of the substance proper (a full-blown sensible τόδε τι). Being sited within the pure nonsensible and hence hitherto *non-localised space* (= one based solely on intelligible matter, yet so far not including local or any other sensible matters beneath, see below, n. 240), this pure spatial εἶδος is *eo ipso* deprived of all locomotion as well (on which even Kant himself provides a strangely pre-Kantian-sounding observation: 'In space considered in itself [Im Raum, an sich betrachtet] there is nothing movable', ibid. 184 = *KrV*, A 41/B 58; yet what should be understood by this somewhat unfortunate phrasing is certainly the *a priori* form when theoretically prescinded and considered in abstract isolation).

164 It cannot be repeated enough that going out into space is not the same as coming into the world. The former is the necessary logico-ontological prerequisite for the latter. Yet the former does not depend upon the latter, while the latter does depend upon the former, as birth depends upon conception and not vice versa. For conception can be suspended and interrupted before coming into the world, but coming into the world is not possible without prior conception. See above, n. 121.

ligible matter. This, however, taken in and of itself, has no contact with sensibility, nor does it correlate or interact with any layers of sensible matter, functioning so far completely independently of them all, in a nonsensible, or, rather, pre-sensible, 'vacuum' of pure (though still no less concrete and physical) spatial extension. This forces us to postulate at least two types of quantification: one *nonsensible*, wholly independent of matter for growth, and the other *sensible*, made possible exactly by this matter, and by it alone.[165] A nonsensible quantification would hence be equivalent to a pure division somehow instituted by a spatial point: since intelligible matter is inherent in the zero-dimensional 'interior' of a στιγμή, the latter, itself indivisible,[166] assumes the role of the principle of division[167] operating in the new medium of pure spatial extension where intelligible matter is now taking hold.[168] Thus, by *doubling* a point, an elementary dyad is es-

165 The differentiation is somewhat reminiscent of the Thomist distinction between two kinds of quantities based on the assumed two different modes of intelligible matter underlying them: 'designated or individual' (*signata vel individualis*) and non-designated or 'common intelligible matter' (*materia intelligibilis communis*, cf. *ST* I^{a}, q. 85, a. 1, ad. 2). Insofar as all intelligible matter, according to Aquinas, underlies quantity ('numbers, dimensions and shapes, which are boundaries of quantities', ibid.), the designated one, itself working as a principle of individuation (cf. *DEE*, c. 2, ll. 73–77; also *ST* I^{a}, q. 75, a. 4, co.), would be the proper substrate of the relative and variable quantitative properties of an individual sensible substance; whereas common intelligible matter (conceived in abstraction from its individual counterpart) would underlie absolute and immutable quantities, escaping sensible matter (cf. Pasnau 2007, 40–42). See below, n. 189.

166 οὐ γὰρ δὴ ἥ γ᾽ ἀδιαίρετος στιγμὴ διῃρέθη εἰς δύο, *Met.* III 5, 1002b3–4; τὸ δὲ πάντῃ [sc. ἀδιαίρετον] καὶ θέσιν ἔχον ... στιγμή, *Met.* V 6, 1016b26.

167 διαίρεσις γὰρ ἡ στιγμή, *Met.* XI 2, 1060b19. Although itself indivisible, the spatial point constitutes the very principle of all spatial division, its very initial step. Such a division is therefore essentially a *gemination*, not a split (διαίρεσις ἀδιαίρετος), see below, n. 178. '[T]he point both holds together and delimits the length: for it is the beginning of the one [sc. length] and the end of the other. But whenever someone takes it this way as if in dealing with one point he is dealing with two points, a stop is necessary, if one and the same point is to be both the beginning and the end' (ἡ στιγμὴ καὶ συνέχει τὸ μῆκος καὶ ὁρίζει· ἔστι γὰρ τοῦ μὲν ἀρχὴ τοῦ δὲ τελευτή. ἀλλ᾽ ὅταν μὲν οὕτω λαμβάνῃ τις ὡς δυσὶ χρώμενος τῇ μιᾷ, ἀνάγκη ἵστασθαι, εἰ ἔσται ἀρχὴ καὶ τελευτὴ ἡ αὐτὴ στιγμή, *Phys.* IV 11, 220a10–13; cf. *Met.* I 9, 992a23–24). The same process is, then, repeated in the case of a line (whose doubling and further multiplication produces a plane), and a plane (whose doubling and further multiplication produces a solid). Cf. *Met.* III 5, 1002a34 ff.

168 Intelligible matter has so far operated in the pre-spatial sphere as abstract *matter for logical division*. By stepping out into space, it initially takes the elementary, atomic form of the spatial point, continuing to work as *matter for ontological individuation*. This first, 'conceiving' and 'prenatal', phase of ontological individuation—the phase (logically) preceding any contact with sensible layers of matter, and therefore also the

tablished, which results in describing the first dimension, the line;[169] from the line (which becomes the first next conveyor of the principle of doubling) then derives the second dimension, the plane; while this one (itself pursuing the same doubling principle) catalyses the third dimension, the solid.[170] The whole process has a purely mathematical character and takes place in the pre-sensible 'vestibule' of the substance, creating an obligatory pre-sensible (transcendental) prelude to its sensible (empirical) birth. This stage may therefore be described as one of *conception*, and it extends from a pointlike exit into space all the way until the final establishment of a pure mathematical solid that has not yet come into contact with any of the sensible layers of matter. 'For [mathematical magnitudes] first develop in the dimension of length, then in that of breadth, and finally in that of depth, until they reach their completion. Hence if what is posterior in terms of development is anterior in terms of substance, the body would be anterior to the plane and length, and therefore more perfect and more complete too, in that *it becomes something animate*—whereas how could a line or plane be animate? Such an assumption would go beyond our cognisance' (emphasis ours).[171] The process is clearly understood to have its biological counterpart, since the pre-solid development of geometrical

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very birth of substance (which is certainly only made possible by matter for generation)—was filled with the pure 'schematic' constitution of a mathematical (geometrico-biological) solid, a three-dimensional 'wireframe graph' of a future substance (see above, n. 163). This is exactly what constitutes the essential task of the 'prenatal' (pre-sensible, transcendental) phase of ontological individuation: it gives the substance its pure stereometric solidity, thus allowing it to connect to the rest of the sensible layers of matter and take up the wholesale range of sensible properties belonging to a fully actualised τόδε τι. Such connection would not be possible otherwise with something less than the solid: hence the substance is *at least* the solid. Three-dimensional solidity is a *necessary condition* for something to materialise as a substance.

169 According to *Met.* I 9, 992a21–22, the point for Plato was 'the beginning of a line' (ἀρχὴ γραμμῆς).

170 ἔτι δὲ φαίνεται ταῦτα πάντα διαιρέσεις ὄντα τοῦ σώματος, τὸ μὲν εἰς πλάτος, τὸ δ' εἰς βάθος, τὸ δ' εἰς μῆκος, *Met.* III 5, 1002a18–20; cf XI 2, 1060b12–16; ἔπειτα δῆλον ὅτι τοῦ αὐτοῦ λόγου ἐστὶ στερεὰ μὲν ἐξ ἐπιπέδων συγκεῖσθαι, ἐπίπεδα δ' ἐκ γραμμῶν, ταύτας δ' ἐκ στιγμῶν, *Cael.* III 1, 299a6–8; cf. 299b25–31.

171 πρῶτον μὲν γὰρ ἐπὶ μῆκος γίγνεται [sc. τὰ μαθηματικὰ μεγέθη], εἶτα ἐπὶ πλάτος, τελευταῖον δ' εἰς βάθος, καὶ τέλος ἔσχεν. εἰ οὖν τὸ τῇ γενέσει ὕστερον τῇ οὐσίᾳ πρότερον, τὸ σῶμα πρότερον ἂν εἴη ἐπιπέδου καὶ μήκους, καὶ ταύτῃ καὶ τέλειον καὶ ὅλον μᾶλλον, ὅτι ἔμψυχον γίγνεται· γραμμὴ δὲ ἔμψυχος ἢ ἐπίπεδον πῶς ἂν εἴη; ὑπὲρ γὰρ τὰς αἰσθήσεις τὰς ἡμετέρας ἂν εἴη τὸ ἀξίωμα, *Met.* XIII 2, 1077a24–31. Cf. also 1077a19–20, where ἄψυχον is equated with an imperfect magnitude (ἀτελὲς μέγεθος) = point, line or plane; and ἔμψυχον with the perfect one = solid. Cf. the same point, but in reverse: 'The geometrician considers man [...] *qua* something sol-

objects is all too obviously conceived in a no less 'gestational' manner than the ordinary prenatal development of living beings: both are fairly explicitly treated as members of a unique, a *geometico-biological* class. If it be not so, what on earth would the odd locutions ἔμψυχος γραμμή and ἔμψυχον ἐπίπεδον mean? Judging by the philosopher's rhetorical question, lines and planes would at any rate be clearly predestined to become the characteristics, or 'affections' (πάθη)—actually, *bodily boundaries*—of both ἔμψυχα and ἄψυχα indiscriminately alike, and in essentially the same manner.[172] Accordingly, the purely biological, embryonic development of the animal germ would have all the features of an ordinary geometrical construction: starting with a zero-dimensional point[173] (one-cell stage embryo, zygote), through a one-dimensional line (two-cell stage embryo),[174] and a two-dimensional plane (four-cell stage embryo),[175] to a three-dimensional cube (eight-cell stage embryo), further progressing towards the perfection of a sphere (sixteen-cell stage embryo, morula). Biology teaches us that this first phase of the 'geometrical' division of the fertilised egg unfolds in its interior and does not affect its outer size, which remains perfectly unaltered—viz. *unaugmented*[176]—all the way up to the so-called implantation. From then on, the internal 'cleavage' comes to a close and the external

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id' (ὁ δὲ γεωμέτρης [sc. ἐθεώρησεν εἴ τι τῷ ἀνθρώπῳ συμβέβηκεν] ... ᾗ στερεόν, *Met.* XIII 3, 1078a25–27). See above, n. 119.

172 ἔμψυχον σῶμα is in fact ambiguous—σῶμα λέγεται πολλαχῶς—and therefore, it seems, almost intentionally used as a 'metabatic' link between the two γένη, geometrical and biological. As can be seen from the rest of the context, the rhetorical wondering *How could a line or plane be animate?* does not really refer to the purported inadequacy of geometrical objects as such to assume the specifically biological characteristic of being enlivened, but to the fact that the geometricals inferior to the three-dimensional solid cannot exist independently (which is the sole privilege of the solid), 'independent existence', for its part, being conceived in entirely biological terms (as 'being enlivened'). The line and the plane (and the point, of course) cannot *live on their own accord*, unlike the solid, which is, on the contrary, *a fully self-sustainable living body*, ἔμψυχον σῶμα. Since it is the soul that is the sole cause of unity and cohesion (αἴτιον τοῦ ἓν εἶναι καὶ συμμένειν, *Met.* XIII 2, 1077a23–24), the solid will owe its unity and cohesion solely to the fact of being ensouled, enlivened, ἔμψυχον; while its boundaries, themselves ἄψυχα, will subsequently become ἔμψυχα in virtue of their functional inclusion in the unity and cohesion of the solid (cf. also *Met.* VII 16, 1040b10–12).

173 In fact, the zoologist Aristotle has a fairly clear-cut idea of the specific biological nature of the 'ensouled point' (ἔμψυχον σημεῖον, στιγμὴ αἱματίνη, *HA* VI 3, 561a11–13, cf. quotation in n. 147).

174 ἔμψυχος γραμμή

175 ἔμψυχον ἐπίπεδον

176 And hence—as a logical consequence of not changing the outer size—in a way *outwardly pointlike* even at the final stage of being transformed into a mathematical solid.

augmentation of the embryo begins,[177] while the elementary solid, a pure pre-sensible proto-substance, passes from the exclusive jurisdiction of ὕλη νοητή under the joint sovereignty of ὕλαι αἰσθηταί.[178]

177 Implantation is sometimes seen as the opening stage of pregnancy *stricto sensu*. Viewed in legal and ethical terms, what we are dealing with here is already a *man* (in the form of a specifically human embryo). Abortion, which until this point is only a matter of medical concern, now becomes a legal-ethical issue, a problem concerning the *individual*, the human substance.

Let us add that even the days from fertilisation to implantation (the so-called 'germinal stage' of gestation) would not accordingly be counted in the lifetime of an individual. The onset of time coincides with the onset of augmentation of the implanted zygote (inception of the 'embryonic stage'). The period of cleavage (i.e. conception = from fertilisation to implantation) would thus not belong to the lifespan of an individual.

178 Logical division and geometrico-biological constitution (as its spatial 'antipode') are in a way reflected in each other like in a mirror: we are concerned here with the same process carried out in two different media, not to say two 'states of aggregation', logical and spatial ('arithmetical' and 'geometrical', cf. *Met.* XIII 3, 9, 1078a24–27). While the process of logical derivation of the infima species had the character of division proper, i.e. *descent* to the indivisible logical unit (μονάς); the process of geometrical (geometrico-biological) constituting a solid would contrariwise be a sort of *laterally inverted division*, i.e. *ascent* from an indivisible spatial point (στιγμή) to the divisible line, etc. Instead of *restricting the class* within a logical, pre-spatial domain (e.g. from 'body', via 'animal', to 'human'), in the area of spatial extension, an analogous *enlargement of the class* comes about (e.g. from one point to two and more points = line; from one line to two and more lines = plane; from one plane to two and more planes = solid). It is true, indeed, that Aristotle construes the constitution of the point in terms of *division* of the line, the constitution of the line in terms of *division* of the plane, and the constitution of the plane in terms of *division* of the solid (cf. *Cat.* 6, 5a1–6; *Met.* III 5, 1002a34–b4). Consequently, the process of creating a line from a point, a plane from a line, and a solid from a plane would not in truth have the character of division, but, rather, *anti-division*, i.e. *gemination*, laterally inverted division mirroring the reverse process that took place in the pre-spatial, logical sphere. (Logical division and geometrico-biological constitution stand therefore in a mutual relationship typical of two symmetrical and laterally inverted mathematical operations: division and multiplication, the latter taken as a reverse division, a division progressing backwards. For the passage from a point to a line, etc. is not a division but a multiplication, in fact, gemination, progressive doubling.) As at the bottom of the funnel of Dante's Inferno, one single continuous momentum—while retaining a unique direction (somewhat like the direction of the temporal flux at the transition from the BC to the AD timescales, via the common year one, as the 'time-unit' and 'time-uniting' year)—suddenly changes the *character* of this very direction, turning it from a descent (κατάβασις) into an ascent (ἀνάβασις). Thus the logical ('arithmetical') and spatial ('geometrical') cones are related in the manner of the two symmetrical cones of the hourglass, through the narrow neck of which a non-spatial μονάς continuously flows into a spatial στιγμή; or again—after turning the 'clock' and leaking of the last pointlike grain of an individual bodily existence—a spatial στιγμή into a non-spatial μονάς (in a free 'Euripus-like' two-way alternation). 'Of what is indivisible

7.8.3 Given the essential nonsensibility of intelligible matter, the primordial movement from spatial point to solid—inasmuch as it takes place in a medium of pure pre-sensible spatial extension—would have the character of a pure geometrical constitution;[179] just as in the phase preceding the exit into space, the corresponding, inversely mirrored, movement—the equally primordial movement from the genus remotissimum (i.e. category) down to the infima species, the logical unit—assumed the character of a pure logical division. Both kinds of movement are essentially non-locomotor in character. This of course makes complete sense given that intelligible matter does not involve the local, nor indeed any of the remaining layers of sensible matter below it. Now insofar as *time* appears as a measure ('number' or 'count') of locomotion,[180] the absence of local movement would in consequence entail the absence of time as well.[181] Thus the pure geometrical movement from point to solid would be no less non-temporal than was the pure logical movement from the highest genus to the lowest species. Such a *mathematical movement*—common and unique to both Janus-like hemispheres of intelligible matter, 'arithmetical' and 'geometrical'—proves hence to be a kind of *essentially static and therefore freely reversive transformation* that has no unidirectional and irrevocable character, otherwise inherent in other, sensible types of change,[182]

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with respect to quantity and *qua* quantity, that which is entirely [indivisible] and has no position is called a unit [μονάς], and that which is entirely [indivisible] and has position—a point [στιγμή]; that, again, which is [divisible] in one way [is called] a line; in two ways—a plane, and that which is [divisible] in all three ways with respect to quantity—a body. And backwardly, that which is divisible in two ways—a plane, in one way—a line, whilst that which is in no way divisible with respect to quantity is a point and a unit: when it has no position—a unit, and when it has position—a point' (τὸ μὲν οὖν κατὰ τὸ ποσὸν καὶ ᾗ ποσὸν ἀδιαίρετον, τὸ μὲν πάντῃ καὶ ἄθετον λέγεται μονάς, τὸ δὲ πάντῃ καὶ θέσιν ἔχον στιγμή, τὸ δὲ μοναχῇ γραμμή, τὸ δὲ διχῇ ἐπίπεδον, τὸ δὲ πάντῃ καὶ τριχῇ διαιρετὸν κατὰ τὸ ποσὸν σῶμα. καὶ ἀντιστρέψαντι δὴ τὸ μὲν διχῇ διαιρετὸν ἐπίπεδον, τὸ δὲ μοναχῇ γραμμή, τὸ δὲ μηδαμῇ διαιρετὸν κατὰ τὸ ποσὸν στιγμὴ καὶ μονάς, ἡ μὲν ἄθετος μονὰς ἡ δὲ θετὸς στιγμή, *Met.* V 6, 1016b23–31; for the occasional loose use of the term 'body' as a synonym for 'solid', cf. above, n. 172, and below, n. 197).

179 Almost in terms of Kantian 'transcendental schematism', see above, n. 163.

180 χρόνος μὲν γὰρ ὁ τῆς φορᾶς ἀριθμός, *Phys.* IV 11, 220a3–4; ὁ μὲν γὰρ χρόνος ὁρίζει τὴν κίνησιν ἀριθμὸς ὢν αὐτῆς, ἡ δὲ κίνησις τὸν χρόνον, IV 12, 220b16–18; τῷ μὲν γὰρ χρόνῳ τὴν κίνησιν, τῇ δὲ κινήσει τὸν χρόνον μετροῦμεν, 220b23–24; ἐστὶν ὁ χρόνος μέτρον κινήσεως καὶ τοῦ κινεῖσθαι, 220b32–221a1; οὐ γὰρ κίνησις ὁ χρόνος, ἀλλ᾽ ἀριθμὸς κινήσεως, 221b10–11; χρόνος δὲ ἀριθμὸς κινήσεως, *Cael.* I 9, 279a15.

181 ἢ γὰρ [sc. ὁ χρόνος] τὸ αὐτὸ [sc. τῇ κινήσει] ἢ κινήσεώς τι πάθος, *Met.* XII 6, 1071b10–11; ἤτοι κίνησις ἢ τῆς κινήσεώς τί ἐστιν ὁ χρόνος. ἐπεὶ οὖν οὐ κίνησις, ἀνάγκη τῆς κινήσεώς τι εἶναι αὐτόν, *Phys.* IV 11, 219a8–10.

182 '[I]t is not possible that there is *before* and *after* if there is no time' (οὐ γὰρ οἷόν τε τὸ πρότερον καὶ ὕστερον εἶναι μὴ ὄντος χρόνου, *Met.* XII 6, 1071b8–9).

all ultimately reducible to locomotion.[183] Thus, being matter for changing the spatial point into a solid (via line and plane as intermediaries), intelligible matter would *eo ipso* work as matter for an equally non-temporal *backward process* of gradual 'degeneration', viz. de-dimensionisation and de-spatialisation of a solid, leading (via plane and line) back to the zero-dimensionality of a spatial point, and even further, to complete spatial annihilation, the ultimate fading of a 'geometrical' στιγμή into a non-spatiality of an 'arithmetical' μονάς.[184]

7.8.4 Let us take a look once more at the two types of quantification to which a substance is subject in the process of its actualisation: *internal division* ('cleavage'), which is solely confined to the sphere of pure intelligible matter and completely independent of all the sensible matters 'below';[185] and *external augmentation*, which as such, depends directly on matter for growth and diminution (and therefore, indirectly, also on matter for alteration and local matter).[186] These two essentially different types of quantification establish two essentially different types of quantities: intelligible (transcendental) and sensible (empirical). Geometrical lines, planes and solids, in fact bodies of all shapes, animate and inanimate alike, in short, all sensible objects seen not *qua* sensible but *qua* mathematical,[187]

183 We once again recall the already cited passage, one of the three explicitly mentioning intelligible matter: 'One matter is sensible, the other intelligible: sensible, e.g. bronze, wood and *any movable matter* [...]' (*Met.* VII 10, 1036a10–11; see above, n. 114). Aristotle's wording (οἷον χαλκὸς καὶ ξύλον καὶ ὅση κινητὴ ὕλη) clearly implies that the *alternative* matter, the intelligible, being in itself nonsensible, is devoid not only of any qualitative determinations but also of locomotor mobility in space (the latter, as said, in no case to be simply equated with the domain of sensibility). Cf. *Met.* XIII 2, 4–8: 'mathematical solids' (μαθηματικὰ στερεά, XIII 2, 1076b23–24; 1076b31–32) = 'immovable solids' (ἀκίνητα στερεά, 1076b21, 34). Yet see above, n. 110.

184 On the 'alternating flow' of the two modes of 'indivisible one', see above, n. 178.

185 *Pre-sensible quantification* (which takes place within the framework of intelligible matter, in the 'prenatal', 'gestational' stage of substance formation) is essentially an *internal division* ('cleavage', or internal gemination). At this point, the solid becomes dimensioned in space, but without any contact with the sensible layers of matter, finding itself in a 'transcendental vacuum' of pure spatial extension, that is to say, an extension still completely devoid of sensible matter (for space as such should not be confused with the domain of sensibility).

186 *Sensible quantification* (which goes beyond the bounds of intelligible matter, starting with the birth and entry into the world of sense) is essentially an *external augmentation*, so that it depends directly upon matter for growth and diminution, but indirectly also on the above sensible layers, matters for alteration and locomotion, since augmentation relies on nutrition, and this again is nothing more than one specific form of qualitative change. The alteration itself is, for its part, only a specific form of locomotion.

187 ἔνεστιν ἐν τῷ στερεῷ ὁποιονοῦν σχῆμα, *Met.* III 5, 1002a21. 'Hermes in stone' (ἐν τῷ λίθῳ Ἑρμῆς), mentioned in the following text (1002a22, as well as in V 7, 1017b7, and

all are marked by some *inherent intelligible size*—a size that has an absolute, fixed and invariable character, representable by a formula (λόγος) valid for all instances of the same type. From the mathematical point of view, there is only one cube: its size has an *essential* character expressed by an equation formula defining the construction of the cube, the mathematically describable ratio of its constructive elements. Unlike the absolute size of the intelligible cube, which has the invariable value of a rule, the relative size of sensible cubes has an *accidental* character, and as such, of course, varies infinitely—in fact, precisely owing to the principled opportunity offered by matter for growth and diminution (as the kind of matter allowing for the shift of quantitative contraries): concrete individual specimens of sensible cubes can thus be large and small, as well as damaged, dented, defective or deformed, eccentric, irregular and in many respects otherwise imperfect, only approximate, contingency- and perishability-laden. An intelligible cube, though, devoid of the slightest admixture of the sensible, contingent and variable, would, on the contrary, have only one, absolute and non-relative size, invariable and fixed, eternally pregiven and decreed in the unshaken formula of its construction.[188] Unique,

IX 5, 1048a32–33, certainly a saying or colloquial expression, see LSJ 691, s.v. Ἑρμῆς, II 3; cf. Ross II 1924, 263) could hardly mean anything other than a sculpture of Hermes, a herm whose 'geometrical' shape in its fully developed three-dimensional spatiality is already potentially contained in a piece of raw marble, the block which the sculptor chose (pointed out with his index finger) to make a sculpture from. The intelligible matter of herm, being the matter of its pure spatial extension (an otherwise 'cubic', viz. quadrangular—tetras, consecrated to Hermes), has already occupied its concrete portion of space within the block of stone even before it is touched by the sculptor's chisel, i.e. before intelligible matter is joined by other, sensible layers. 'Hermes in stone' is therefore a sculpture which is currently only actualised in intelligible matter, only 'conceived', but not yet 'born', not actualised in the remaining, sensible layers of its substance. So it can serve as a text-book example of conceptual art, the offspring of which are only conceived yet still not born (or, rather, already stillborn). See below, nn. 220 and 292.

188 As defined in *Met.* V 13 (in a paragraph on the meaning of the notion of quantity), the line, for instance, would already possess in itself some form of *inherent quantity*. Aristotle calls these inherent quantities *essential*, or *quantities in and of themselves* (τὰ καθ᾽ αὑτὰ ποσά), as opposed to *accidental* or *contingent and dispensable quantities* (τὰ κατὰ συμβεβηκός sc. ποσά), the essential ones being further subdivided into *substantial* (τὰ κατ᾽ οὐσίαν sc. ποσά) and *attributive* (τὰ πάθη καὶ ἕξεις τῆς τοιαύτης οὐσίας). As an instance of the *essential substantial quantity*, the philosopher, as mentioned, gives the geometrical line (which is called substantial, certainly not because it might perhaps possess some substantiality on its own, but because it participates in the constitution of a solid, a geometrical substance): 'Amongst the essential quantities [= the quantities in and of themselves], some are so with regard to their substance, as, for instance, a line is some [essential] quantity (because in the formula expressing

absolute and paradigmatic, such a cube will be distinguished from the Platonic one only in that it will occupy a concrete, particular portion of physical space possessed by it alone, inaccessible to any other body, solely replete with the particular, yet nonsensible, solidity of a this-here cube. Each particular cube of Aristotle (seen not *qua* sensible but *qua* mathematical) would thus be characterised by a size which, no less than that of Plato's ideal cube, will not allow any variances, nor will be concretely determinable and expressible in terms of relative and variable numerical values. Although being a sort of default, 'setpoint' cube, a cube 'in and of itself', this transcendental solid will nonetheless occupy a very particular portion of three-dimensional space, and will therefore constitute a kind of Platonic cube somehow inscribed into a concrete physical hereness, endowed with concrete stereometric haecceity belonging to it alone—easy to point to with the finger, yet impossible to grasp with the hand.[189]

its essence, a quantity is inherent) [...]' (τῶν δὲ καθ' αὑτὰ [sc. ποσῶν] τὰ μὲν κατ' οὐσίαν ἐστίν, οἷον ἡ γραμμὴ ποσόν τι (ἐν γὰρ τῷ λόγῳ τῷ τί ἐστι λέγοντι τὸ ποσόν τι ὑπάρχει) ..., *Met.* V 13, 1020a18–19). This essential, *essentially inhering* (ὑπάρχων), or *essence-defining*, quantity (viz. 'plurality', πλῆθος, a *multitude of discrete or absolute units*, *Met.* V 13, 1020a10–11; 1020a13–14; cf. *Cat.* 6, 4b25–37; 5a23–37) in the case of a line would no doubt be that which is potentially divisible into one-dimensional discrete units (each repeating the same essence); in the case of a plane—that which is potentially divisible into two-dimensional discrete units (each repeating the same essence); and in the case of a solid—that which is potentially divisible into three-dimensional discrete units (each repeating the same essence). As for the point, its essential, or essentially inhering, quantity would be that which is in no way divisible—yet unlimitedly geminable, i.e. multipliable into a plurality of zero-dimensional units (immediate products of spatial individuation). See below, n. 215.

189 It is to be noted that the two different kinds of quantity, invariable and variable, are not unknown to classic Thomism either. Still, the above-proposed distinction deviates from that of Aquinas in one crucial point—that, namely, on which the classic Thomist conception of individuation rests. According to Aquinas, it is precisely 'designated' or quantified intelligible matter (*materia signata*, *DEE*, c. 2, ll. 73–77; also *materia sub quantitate determinata* of the spurious *De principio individuationis*, p. 151 [428] Spiazzi) that functions as an individuating principle—a view which is essentially adhered to by our present interpretation. The essential divergence, however, would consist in the understanding of the true nature of this quantifiedness, the 'designation' (*signatio*) of intelligible matter. According to the Thomist view, the designated or individual intelligible matter is also responsible for the concrete variability of the inherent quantity ('[I]ts [= matter's] designation consists in existing under certain dimensions which make being here and now perceptible to the senses', *signatio eius* [sc. *materiae*] *est esse sub certis dimensionibus, quae faciunt esse hic et nunc ad sensum demonstrabile*, *De natura materiae*, c. 3, p. 134 [377] Spiazzi); whereas the invariable quantities, on the other hand, would be duly founded on non-designated, that is, 'common', and, ultimately, on primordial matter (gr. πρώτη ὕλη), characterised by an essential disposition towards stable and invariable magnitudes, *dimensiones indeterminatae* ('[T]hus, dimensions are firstly called indeterminate before they are said to be actualised', *sic dimensiones*

7.9 In an effort to isolate the specific meaning and responsibilities of intelligible matter in a sense that would systemically integrate all

praedictae sunt indeterminatae antequam dicantur esse in actu, *De natura materiae*, c. 7, p. 140 [401] Spiazzi; 'Quantity can therefore be thought of in the underlying matter before the sensible qualities—by which matter is called sensible—are thought of there. So, according to the reason of its substance [= its essential nature], quantity does not depend upon sensible matter, but only upon intelligible matter', *Unde quantitas potest intelligi in materia subiecta, antequam intelligantur in ea qualitates sensibiles, a quibus dicitur materia sensibilis. Et sic secundum rationem suae substantiae non dependet quantitas a materia sensibili, sed solum a materia intelligibili*, *Super Boetium de Trinitate*, q. 5, a. 3, ll. 191–196; cf. *ST* I^{a}, q. 85, a. 1, ad. 2; see O'Reilly 1989, 83, 86; on the ultimate Averroist origin of 'the idea of a material substratum that is constitutively quantified and indeterminately dimensioned', see Giglioni 2013, 25). In our reading, which seeks in this respect to follow as much as possible the original tenet of the Stagirite's own thought, intelligible matter (which by default lacks the innate volatility of sensible matter) could only establish steady invariant quantities, 'standard measures' completely ignorant of opposing alternatives; whereas the dynamics of contrarian variability and relativity would be introduced into them solely by virtue of their posterior connection with sensible matter (precisely, matter for growth and diminution). Again, since intelligible matter is the principle of individuation and multiplication, these nonsensible fixed, invariable and indeterminate standards will necessarily be characterised by numerical 'more-than-oneness', spatial plurality (πλῆθος). This is what makes possible the existence of 'this cube' and 'that cube', actually infinitely many spatially distinct copies of the same geometrical shape. But also of shapes that are not geometrical in the narrow sense, since intelligible matter stores in itself the prototypes of spatial extensions of virtually every three-dimensional species imaginable, geometrical as well as natural: 'this man' (Socrates) and 'that man' (Callias) are but two of infinitely many spatially distinct replicas of the same three-dimensional prototype of the species/shape 'human' (for simple individuation, or differentiation only at the level of intelligible matter, means that Socrates and Callias, being εἴδει the same, differ so far exclusively in terms of pure numerical otherness, only *qua* two spatially distinct human-shaped solids, otherwise completely identical, with no sensible differences involved as yet). Thus the 'common intelligible matter' of Aquinas corresponds to our intelligible matter observed in theoretical isolation (viz. before association with other, sensible layers of substance, the latter being heretofore only conceived, but not yet born); while the 'designated' or 'individual intelligible matter' of the Angelic Doctor would amount to our intelligible matter in the context of an already actualised ('born') sensible substance. So the essence of individuation, according to our reading, would not reside in the 'designation' as such, not in the εἶδος' connection with the sensible, but precisely with nonsensible, intelligible matter. For it is intelligible matter that is the sole authorised carrier of *principium individuationis*. As a consequence thereof, the substance will already be individuated at a pre-sensible level, without any influence from the inferior, sensible material layers, each with its own special assignment (other than individuation). The thisness and hereness of a cube or a Socrates and their spatial 'one-among-otherness' depend thus solely on intelligible matter, and are already established in the pre-sensible, transcendental vestibule of being, prior to any designation or birth. Since the essence of individuation consists in the simple acquisition of a permanent and inalienable particle of a pre-sensible space (that is, of a concrete physical space, yet *taken in its pure pre-worldliness*), Socrates is already individuated as a spatial point, a geometrico-biological zygote that has just been conceived.

the particular functions mentioned so far—mainly those of matter for specification and matter for individuation[190]—we are not uninclined to designate it with the common label of *matter for metabasis eis allo genos*. First of all, it is intelligible matter that is responsible for defining the overall material component of a substance in terms of *a certain potentiality*: for it is only by means of intelligible matter (and not of any of the remaining material layers, each charged with its own specific task) that a disintegrated heap of stones, bricks and wood emerges a 'house(-to-be)'; an unworked piece of marble—a 'Hermes(-to-be)';[191] or an unfertilised human egg—a 'man(-to-be)'. Such an interior concentration and crystallisation of the specific potentiality of a substance unfolds exactly at the level, and by means, of intelligible matter and is, as stated, one of the two main functions of its specific area of operation. With this in mind, we may wonder: why intelligible matter is so peculiarly appropriate for the designation as a *matter for metabasis eis allo genos*?

The awakening and articulating the latent conceptual predispositions in a matter which, after having been disintegrated and unnamed, suddenly becomes integrated and named; reinforcing it by interior conceptualisation and qualifying it by means of a clearly defined potentiality of its own; all this, as we have seen, are only steps in the usual process of *logical division*. In it, intelligible matter assumes the role of a *continuous genus* which, dividing itself from one step to another, eventually ends up in an infima species: a concept driven to the ultimate extreme of logical determination—logical μονάς.[192] On the basis of this logical operation, a disintegrated, conceptually inarticulate and unnamed heap of stones, bricks and wood becomes integrated, conceptually reinforced and renamed as a 'house(-to-be)', a house in potentia; whereas an unworked piece of marble appears as a 'Hermes(-to-be)', a Hermes in potentia; and an unfertilised egg as a 'human(-to-be)', a man in potentia. At this stage, thus, intelligible matter assumes the capacity of the principle of specification, while the metabasis takes on the character of the common logical division, the continuous transition from a genus to a subordinate species, which in turn equates to a new genus and so on and so forth, by chain derivation, right down to the lowest of species—a genus incapable of further autogenetic division (that is, μονάς). All this transition is actually nothing but *metabasis* from one, higher, *to another*, lower and, finally, the lowest *genus*.[193]

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190 Cf. above, n. 145.

191 ἐν τῷ λίθῳ Ἑρμῆς

192 See above, n. 141.

193 This first stage of metabasis could therefore be more specifically termed a *descent*, κατάβασις εἰς ἄλλο γένος.

However, intelligible matter operates as the principle of metabasis in yet another sense, that which could justly be termed preeminent and paradigmatic. The first next step, the miraculous transition from μονάς to στιγμή, may undoubtedly be baptised a metabasis *par excellence*. This central leap from logical to ontological genus would therefore constitute in a way the 'classic' form of the *metabasis eis allo genos*: it is here that the genus most utterly and most decisively changes its own ontological status—its ontological 'state of aggregation'—moving from the indivisible non-spatial unit (μονάς), the logical infima species, to the indivisible spatial point (στιγμή), the ontological infima species. At this stage, thus, intelligible matter reaches its full capacity as the principle of individuation—*metabasis* from one, not yet individuated, but only logical, *to another*, already individuated, ontological, viz. spatially extended *genus*.[194]

Now the second main function of intelligible matter, as we have seen, consists in the geometrical (geometrico-biological) constitution of a solid, that basic ontological prerequisite for any subsequent actualisation of the substance as a bodily enmattered, sensible τόδε τι. The sensible layers of matter would simply not be able to integrate—they would in truth have nothing to *integrate with*—if there were not a pure 'transcendental schema' in the form of a particular, numerically unique and spatially individuated solid to reinforce them internally and enable their inner cohesion. The specific duty of the solid would therefore be to serve as a concrete nonsensible 'reinforcement cage' around which, like flesh around the bones, all the remaining, sensible layers of matter would assemble in due sequence, stuffing this pure pre-sensible (transcendental) mould with sensible (empirical) content. As for the process of developing a solid from a point,

194 The individuation, as an ontological metabasis from the 'arithmetical' to the 'geometrical' medium (μονάς and στιγμή being in fact arithmetico-geometrical *equivalents*, two *modes* of the same *ultimately indivisible quantity*, cf. *Met.* V 6, 1016b24–26), proves to be a sort of *dialectical refutation* of the formal interdict preventing any cross-generic metabases (as formulated in e.g. *An. Post.* I 7, 75a38: οὐκ ἄρα ἔστιν ἐξ ἄλλου γένους μεταβάντα δεῖξαι, οἷον τὸ γεωμετρικὸν ἀριθμητικῇ). At the moment of fertilisation, a unique logico-ontological quantity of single extension is set up—for also extension λέγεται πολλαχῶς: hence this extension is to be taken both logically, as an individual concept, a *subinfimal logical magnitude* 'Socrates'; and ontologically/spatially, as a spatial point, a *subinfimal spatial magnitude* Socrates, a pointlike Socrates, spatially embedded in his mother's egg that has just been fertilised. A subinfimal logical magnitude, an individual concept, 'flows' into a subinfimal spatial magnitude, an individual spatial point (and vice versa, in atemporal Euripus-like two-way alternation). These are two Janus-faced aspects of a single, numerically unique magnitude of the *logico-ontological extension one*, the *logico-ontological (= prespatio-spatial) point*, continuously flowing and reflowing from one to another hemisphere of intelligible matter.

through line and plane—the second essential stage in the operating of intelligible matter—Aristotle explicitly characterises it as the *metabasis eis allo genos*: here a point passes to a line, a line to a plane, and a plane to a solid.[195] Thereby the whole metabasis process turns out to be fully rounded out. For there is no spatial genus that would be superior to a solid: the three-dimensional, space-filling body is as such complete and perfect and (unlike the preceding, constituent genera) it lacks nothing; and that which lacks nothing has neither need nor capacity to pass to another (upper) genus. *Omne trinum perfectum.*[196] '[O]ne thing, however, is clear: that there is no transition [sc. from solid] to another [= still further] kind [sc. of geometrical objects, εἰς ἄλλο γένος μετάβασις], the way it was from length to surface, and from surface to body; for such a thing [= the one that would surpass the solid in number of dimensions] would no longer be a perfect magnitude. It is necessary that an exceedance comes about due to a deficiency, yet what is perfect cannot be deficient—for it is [already] complete.'[197] So once the solid is constructed, the whole province of intelligible matter as matter for *metabasis eis allo genos* is traversed from one end to the other. This domain would therefore extend from the least concrete and least defined genus remotissimum (category) *down* to the infima species, the ultimate non-spatial residue of logical division (μονάς); and then beyond, from the spatial point (στιγμή), as a kind of spatial infima species, the ultimate residue of spatial division and the most deficient of spatial genera, *up* to the most concrete and most defined genus, the perfect, complete and absolutely self-contained solid: the pre-sensible three-dimensional 'wireframe model' of a future sensible, fully-fleshed

195 Therefore it would be more appropriate to label this stage of metabasis as an *ascent*, ἀνάβασις εἰς ἄλλο γένος.

196 On the allegedly Pythagorean origins of the doctrine of the triad as a perfect number, and the three-dimensional body as a perfect geometrical figure, see the opening chapter of *On the Heavens* (*Cael.* I 1), 'a prose hymn to bodies' (Betegh–Pedriali–Pfeiffer 2013, 55), from which the ensuing quote is taken.

197 ἀλλ᾽ ἐκεῖνο μὲν δῆλον, ὡς οὐκ ἔστιν εἰς ἄλλο γένος μετάβασις, ὥσπερ ἐκ μήκους εἰς ἐπιφάνειαν, εἰς δὲ σῶμα ἐξ ἐπιφανείας· οὐ γὰρ ἂν ἔτι τὸ τοιοῦτον τέλειον εἴη μέγεθος· ἀνάγκη γὰρ γίγνεσθαι τὴν ἔκβασιν κατὰ τὴν ἔλλειψιν, οὐχ οἷόν τε δὲ τὸ τέλειον ἐλλείπειν· πάντῃ γάρ ἐστιν (*Cael.* I 1, 268a30–b5; cf. also 268a7–10). According to Betegh–Pedriali–Pfeiffer 2013, Aristotle's argument would flow from the allegedly Pythagorean premise of the perfection of the triad (as well as from traditional ritual and linguistic practices involving number three), and would ultimately be a biased theoretical endorsement of three-dimensional bodyhood as opposed to the Plato's denouncing the corporeal world (hence the purportedly deliberate terminological indistinction between the physical body and the geometrical solid in the quoted passage; yet the two seem to have already been interchangeable with the Pythagoreans themselves, see *Met.* VII 2, 1028b17–18). Cf. above, nn. 172 and 178 ad fin.

substance.[198] (Being only a partially actualised proto-body, a 'schematic' prototype pregiven in a pure, transcendental space preceding sensibility, this yet unborn, immortal and immutable solid actually appears as a pure *privation* of a wholly actualised sensible body which is still to be endowed with all the associated locomotor, qualitative, quantitative and existential properties, that is to say, with a full-range capacity for all manner of accidental and substantial change.)

Although he expressly rules out the prospect of a still further metabasis of the solid, crediting it with the position of an ultimate and absolutely unsurmountable terminus not only of the process of spatial building-up of the perfect geometrical figure, but of the whole multistage prespatio-spatial process of a single uninterrupted logico-ontological division (executed in two main strokes), Aristotle would undoubtedly not disagree that the forthcoming 'clinamen' from intelligible to sensible matter—a sort of leap into the fourth dimension[199]—is in fact yet another metabasis *par excellence*, just as decisive and consequential as that which once made the non-spatial unit a spatial point.

7.10.1 Thus, moving from the top down across all the stratigraphic layers of substance, as if turning, one after the other, the successive transparency overlays in the anatomy book of nature, we first come across the front flap of

1) *Intelligible matter.* Its proper task is, as we have seen, twofold: a) to define the logical identity of a substance-to-be (infima species); and b) to spatially exteriorise this substance-to-be (shaped in the form of the pre-

198 As such, the three-dimensional solid constitutes a *unit of measure* of bodily substance: '[M]easure is called that by which each particular thing is first known, and the measure of each particular thing is a unit—in length, in breadth, in depth, in weight and in speed' (λέγεται μέτρον ᾧ πρώτῳ τε ἕκαστον γιγνώσκεται, καὶ τὸ μέτρον ἑκάστου ἓν ἐν μήκει, ἐν πλάτει, ἐν βάθει, ἐν βάρει, ἐν τάχει, *Met.* X I, 1052b24–27; the last pair, weight and speed, certainly depend on sensible layers of substance, while the first three 'measures', insofar as they are to be taken as units, belong to the realm of intelligible matter, see below, n. 215). 'Again, where it seems impossible to take away or add—that measure is exact' (ὅπου μὲν οὖν δοκεῖ μὴ εἶναι ἀφελεῖν ἢ προσθεῖναι, τοῦτο ἀκριβὲς τὸ μέτρον, *Met.* X I, 1052b35–36). In virtue of its perfection, its substantial irreducibility and immultiplicability, its inability to decrease and increase in number of inherent constituents (in the sense of ἀριθμητὰ ἐνυπάρχοντα, *Met.* V 13, 1020a7–9), that is to say, dimensions—of which there are three in all—the pure intelligible solid constitutes a true measure unit of the substantiality of each τόδε τι. Cf. *Cael.* I 1, 268a9 ff.

199 On the possibility of construing the fourth dimension as time already on the ground of Aristotle's ontology, see below, n. 206.

sensible solid) by allotting it a particular fraction of space to lifetime use. Observed in the laboratory separation from other, sensible layers, intelligible matter reveals itself as a particularly specialised enabler and supporter of a basic, indivisible, indestructible and insuppressible substantial unit, an absolute and canonical measure of individual substantiality, defined both specifically-logically and individually-spatially.[200] Individu-

200 Intelligible matter is a pure pre-sensible matter which, being a transcendental ('schematic') precursor of an intended substance, encroaches on foreign, heterogeneous sensible matter—be it a heap of bricks, a piece of unworked marble, or an unfertilised egg—continuing to occupy it in the manner of a *logico-ontological intruder or invader*. Such an invasive presence establishes, then, the pure privation of a substance intended to be made of foreign sensible matter: a house of a heap of bricks, a herm of a piece of marble, a man of an unfertilised egg. Due to the law of identity, which does not allow the spatial coincidence of two solids (δύο ἅμα στερεὰ εἶναι ἀδύνατον, *Met.* XIII 2, 1076b1; see also below, n. 210), one solid will thereby automatically remove the other: one free, sensibly unrelated intelligible matter 'house', will replace the other bound, sensibly related intelligible matter 'heap of bricks', normally coinciding with the sensible matter of a corresponding heap of bricks. Driven out by the presence of a more prevalent newcomer, the original intelligible matter 'heap of bricks' eventually retreats and leaves, forcibly detached from the naturally co-existing sensible matter of a heap of bricks: from now on, its place will be taken by an alternative intelligible matter 'house'. Thus the newly established intelligible matter 'house' (= a bodyless solid) and the inherited sensible matter of a heap of bricks (= a solidless body) enter a kind of forced marriage (= between a new solid and an old body, stripped of a former solid), a conjugal union notably marked by a name change: the heap of bricks ceases to be called 'heap of bricks'—by its old 'maiden name', as hitherto—and begins to be called 'house'—by its new 'married name'—and therefore *to mean* 'house', and, ultimately, *to be* a house (first a house in potentia, and then a house in actu).

The entire process of redefining substance comprises two continuous stages:

a) the logical stage, resulting in logical *specification* (logical ovulation of a species): in virtue of the *logical (= non-spatial) defining a species* within heterogeneous matter, the latter—a heap of bricks, a piece of unworked marble, an unfertilised egg—becomes the logical abode of a heterogeneous definition, the one not originally pertaining to the given matter; hence a heap of bricks becomes, from now on, defined not only as a 'heap of bricks' but at the same time as a 'house'; a piece of marble becomes defined not only as a 'piece of marble' but at the same time as a 'herm'; an unfertilised egg becomes defined not only as an 'unfertilised egg' but at the same time as a 'man';

b) the ontological stage, resulting in ontological *individuation* (ontological conception of a species): in virtue of the *ontological (= spatial) defining a species* within heterogeneous matter, a concrete pre-sensible solid is conceived within heterogeneous matter, prearranging it to finally give birth to a new autogenous substance: a pre-sensible spatially defined house conceived within a heap of bricks prearranges a heap of bricks to finally give birth to a real sensible house; a pre-sensible spatially defined herm conceived within a piece of marble ('Hermes in the stone') prearranges a piece of marble to finally give birth to a real sensible herm;

ation, however, simultaneously entails multiplication: the establishment of a single instance of a species automatically involves the initiation of the entire class of individuals of the same εἶδος. The existence of Socrates implies the existence of Callias, Coriscus, as well as that of myriads of individual specimens of the human species that have ever existed or will exist someday. Anyhow, it should be stressed that the specific task of individuation belongs solely to the tier of intelligible matter, while other matters do not participate in the concrete implementation of the individuating principle.[201] Each one has its own particular competence, still they are all equally responsible for allowing the substance to receive and to change the accidental properties of this or that type (local, qualitative, quantitative). Yet accidents as such are not the vehicle of individuation but, rather, its natural corollary and concomitance (epiphenomenon). In fact, it is in virtue of individuation that accidental changes at all occur, whereas individuation, in turn, occurs in virtue of intelligible matter alone. Moreover, even the substantial change itself—made possible by the basal layer of the stratigraphic column, matter for generation and corruption—should not be confused with individuation proper, viz. an act of first going out into space. For going out into space is not the same thing as coming into existence: the former belongs to the pre-sensible and pre-temporal phase

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a pre-sensible spatially defined man conceived within an egg prearranges an egg to finally give birth to a real sensible man. ('Prearrange' therefore amounts to = 'qualify by privation'.)

The moves a) and b) have, of course, the character of pure logical movements, which currently unfold in the (pre-sensible, transcendental) phase preceding the introduction of local matter (i.e. local movement and temporality) as well as of all other layers of sensible matter, including matter for generation. It is only by entering the field of sensibility that *conceived* substances are enabled to finally be *generated* or *born*.

201 Joe Jones considers intelligible matter to be responsible solely for the individuation of geometrical objects, while entrusting the task of individuating 'ordinary objects' to common sensible matter, physical 'stuff' (Jones 1983, 95–96). Such an attitude is a natural consequence of the belief that intelligible matter is a matter of mathematical objects alone (see above, nn. 119 and 128). Yet Aristotle expressly has it that intelligible matter exists in every particular thing considered *qua* particular, and 'not *qua* essence or a Form', *Met.* VII 11, 1036b35–1037a2 (Frede athetises the part of the sentence concerning the form, otherwise not seeing in it an allusion to Plato, Frede–Patzig I 1988, 98–99; Frede–Patzig II 1988, 214–15). Oddly enough, these are precisely the lines Jones makes use of to corroborate his own contention. This, however, must inevitably lead to the preposterous conclusion that the particular bronze circle could at the same time be particular in two distinct and separate ways—doubly particular, as it were: on the one side, *qua* sensible, and on the other, *qua* intelligible object—depending on the two different material layers involved in the two parallel individuating processes.

of *conception* (conceptio), while the latter stands at the threshold of the sensible and temporal stage of the real, empirical life of an individual, marking his generation or *birth* (parturitio). While standing only under the authority of intelligible matter, the stereometric solid, so far deployed within the sole limits of pure, transcendental space, still lies outside the sphere of the sensible layers of matter, in a state of peculiar ontological limbo. Out of touch with local matter (the first below), it proves deprived of locomotion, and therefore of temporality as well,[202] completely motionless and timeless—eternal. Unaffected by matter for alteration and matter for growth and diminution, on which it does not depend either, it is at the same time perfectly qualityless and quantityless (its inherent quantity being, as we have seen, quite nonsensible, 'ideal', viz. invariable, formulaically fixed and indeterminate). Moreover, insensitive to very generation, it has not even been born yet—being in reality only *conceived*. On the whole, the substance defined solely in terms of intelligible matter turns out to be an individual, spatially extended body occupying a concrete and inalienable portion of physical space (easy to point the finger at, yet not hand-graspable),[203] otherwise perfectly immobile and non-temporal ('eternal'), lacking in every quality (hence 'intangible' and 'imponderable', devoid of colour, taste and smell, heat and cold, humidity and dryness, etc.), and every quantity (except the 'absolute'), and, eventually, unborn—yet to be born (and accordingly 'indestructible' as well).[204] However, one

202 Time being a 'number' of locomotion (see above, n. 180).

203 The non-graspability of a solid does not contradict its essential impregnability. The absolute inviolability of a space once assigned to a solid proves to be the most central characteristic of the latter, itself establishing the very law of identity, as well as the possibility of spatial collision, mechanical depulsion of individual substances, etc. (see below, n. 210). In a classic scene from Homeric *Nekyia* with Odysseus vainly attempting to embrace his mother's shade (*Od.* XI 204–208), the hero is indeed allowed to freely wave his hand through the nonsensible body of Anticlea—however, to enter fully into the spatial area of her pure *solidity* would be absolutely unthinkable. The inviolability of *the mother's space* (= intelligible matter of each particular thing) appears to be the taboo of all taboos (see below, n. 239).

204 All the difference between the Platonic Form and the Aristotelian intelligible shape (pre-sensible solid)—both of them equally prototypal and eternal—lies in the fact that the Platonic εἶδος has a clearly non-spatial character, while the Aristotelian one—as unique and singular as that of Plato—emerges completely integrated into a concrete three-dimensional spatiality: spatially extended, numerically individualised and, howsoever paradoxically, *multiplied* into countless spatially demarcated copies, each with its own inalienable and unassailable portion of space given in *lifetime* usufruct (that is, put under the protection of a lifetime *genius loci*). According to the overall postulate of the Aristotelian science, this form of εἶδος' existence is the only one that has an objective reality, while the Platonic εἶδος in its peripatetic reinterpretation, as we know, proves

must resist the temptation to declare such an ethereal, asomatous, bland and bloodless body 'mathematical' in the narrow and professional sense of the term:[205] for, according to Aristotle, it is in fact no less 'biological' than purely 'geometrical' in nature; or, rather, *geometrico-biological*—a fully geometrical (= nonsensible), and yet at the same time a fully *animate* body. The fundamental indivisibility of 'mathematical' and 'animate' is one of the most original features of the Stagirite's ontology, distinguishing it in a most characteristic way from the more traditional Pythagorean and Platonic conceptions of the 'mathematical solid'.

2) *Local matter.* By turning the first 'fugitive sheet' of substantial tissue, we leave the province of pure nonsensibility, entering the realm of the highest and most divine of sensible matters—matter for locomotion. If it

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demoted to a mere 'secondary substance' and ultimately transferred inside the soul of the thinking individual (under the name of individual ἐπιστήμη).

205 A temptation which the majority of scholars have failed to resist (see above, nn. 119 and 128). Yet if it is intelligible matter that underlies geometrical objects proper, what would be the material substrate underlying the incidental geometrical properties of 'ordinary objects', in particular those with a distinctly geometrical appearance? It seems that the latter too could hardly rest on any matter other than the intelligible. If by observing a bagel not *qua* bagel but *qua* circle, we reach the theoretical abstraction of a geometrical object comprised in an 'ordinary' one, then the bagel will contain intelligible matter just as much as a circle drawn with a compass and chalk. For in the case of the chalk circle too, the geometrical object is only reached by theoretical abstraction, that is, by observing a chalk circle not *qua* chalk circle but *qua* circle. There is indeed no cogent reason why a circle made of chalk would be a less 'ordinary object' than a circle made of dough. A possible 'professional context' cannot be posited as a serious argument. The objection that the circle was made for the purpose of geometrical proof in no way calls into question the 'ordinary' character of the chalk diagram, the geometrical properties of which are reached only by virtue of abstraction (for these properties are not possessed by a chalk circle *qua* circle made of chalk but *qua* circle). Yet abstraction is just as possible in the case of the bagel. The theorem can be demonstrated as well in a bakery as in a geometry classroom. What makes the context professional is not the classroom, the blackboard or the chalk, the sensible matter from which the geometric-like teaching aid is largely fashioned, but the fact that a geometrical object can be properly recognised in the geometric-like one and then abstracted from it—that is, from an 'ordinary object' of geometrical appearance (regardless of whether it is a circle-shaped amount of chalk powder or a circle-shaped amount of baked dough). And this very recognisability and abstractability rests, of course, on intelligible matter alone: it is the common material substrate of both geometrical and geometric-like 'ordinary objects', with no essential difference that could be clearly observed and strictly defined. Finally, there is no clear-cut criterion that would restrict the process of geometrisation of true natural objects either: for even the most irregular and capricious of shapes found in the natural world could *in ultima analysi* be reduced to various more or less complex 'tessellated systems', so there is no clear reason why intelligible matter should not be inherent *in each and every thing* of the inanimate and animate worlds without distinction.

is intelligible matter that was once charged with introducing the substance into usual three spatial dimensions, now it is up to local matter to usher it into the dimension of time—temporality being the natural measure ('number') of locomotion.[206] Fitted with the additional layer of local matter, the substance ceases to be purely an abstract motionless and timeless solid, congealed in geometrical space. For it is exactly local matter that is responsible for first setting in motion this abstract nucleus (or absolute and canonical measure) of the logical and spatial identity of the substance, thus making it for the first time temporal, although this pure temporality, hitherto isolated from other tiers of matter, has nothing to do with coming into existence and ceasing to exist (which only occurs at the ultimate stage of substance actualisation).[207] In virtue of local matter, individuated and multiplied solids—a whole plethora of individual 'wireframe models' of all imaginable animate and inanimate shapes—suddenly begin to move, to 'rotate' in three-dimensional space and, certainly, to come into mutual contact, those perpetual 'billiard ball collisions' of individual substances ('individual', i.e. = 'atomic' collisions).[208] Yet, to be precise, what brings a

206 See above, n. 180. Building on the three-dimensional solid as a perfect product of intelligible matter, time, as the most important outcome of the first next material layer of substance, matter for locomotion, acquires the status of a kind of 'fourth dimension', almost in line with the modern understanding of time.

207 This pure, eternal temporality only applies to the celestial bodies of the supralunar sphere, those which have no contact with the lower tiers of sensible matter. However, if each temporality implies some admixture of *temporarity*, the eternal character of supralunar temporality would also include an apparently paradoxical tinge of finality. This 'infinite finality' of celestial time should not however be confused with the common generability and corruptibility inherent in the objects of the sublunary sphere. It only affects the *single cycles* as such, making them one-off and irreversible despite the never-ending eternity of their rotations. As for the finite beings of the sublunar realm, they in fact imitate the rotatory motion of the celestial bodies, being themselves involved in the process of continuous generation (συνεχὴς γένεσις), established by God as a compromise between eternity and corruptibility—the closest approximation to eternal existence (*GC* II 10, 336b31–337a1).

208 Since the material component of the substance taken in its entirety constitutes an overall *passive substrate* for all sorts and kinds of accidental and substantial changes (ὑποκείμενον ταῖς μεταβολαῖς, *Met.* VIII 1, 1042a33–34), and not, perhaps, the originative source (ἀρχή) of these changes; local matter, as one of the material layers of substance, is nothing other than the passive principle specifically responsible for allowing changes in the field of locomotion, and not, perhaps, the active, efficient cause of these or those locomotor changes as such (the material cause contributes inertia but not impetus, which is the specific task of causa efficiens). It is therefore not local matter that decides the precise form of locomotion, nor is it at all its proper task and responsibility to make such a decision: from the point of view of local matter, it is completely irrelevant whether locomotor change has a spontaneous and autoge-

trait of eccentricity and clutter into this motion (which otherwise, in its immaculate purity, would have only a neat circular character allowing for no collision whatsoever)[209] does not originate from local matter itself, but from the lower material 'spoilers' that are only subsequently attached to the otherwise unperturbably revolving solids; the first next below being

3) *Matter for alteration*. Each material level stands in direct logico-ontological dependence to its nearest superior, and through it to the rest and the highest. The immediate dependence of matter for alteration upon local matter is reflected in the fact that no alteration can be self-generated (simply derived from matter for alteration as such), but is always commissioned by the outer affection of another foreign substance operating as an efficient cause of qualitative change: this again entails the concrete spatial contact of the two substances, which, in turn, results from a gradual decrease in the spatial distance between the agent and the patient, up to zero separation and the ultimate closing of the spatial gap between the two surfaces. So here we have a fairly simple form of locomotion—the limited movement of one substance advancing towards another, the latter interposing like an impregnable barrier terminating the simple unidirectional progression of the former. This limited and relative nature of locomotion in the sublunary realm results from the simple existence of

nous character (as in the case of all self-propelled living organisms, as well as the very unmoved mover and his celestial entourage, heavenly intelligences, see above, n. 123), or if it is externally prompted and heterogeneous (such as the passive locomotion of lifeless objects as well as living beings somehow impelled from the outside, or 'phoretically' piggybacking on other movers, alive or lifeless, cf. *De An.* I 3, 406a18–20). Both modes of locomotion depend equally and indiscriminately upon the one self-same matter—matter for locomotion. Local matter is thus as essentially matter for spontaneous as for non-spontaneous locomotion (*Met.* VII 9, 1034a13–14): it is simply a principle allowing movement in space, whatever the particular modality of movement or the source of it. For the local movement of an animal can take both forms alike: a horse can move from one spatial point to another either by walking on its own feet, or by being transported in a horse box. What is important here is that both forms of locomotion, active and passive alike, are made possible by one and the same local matter which is contained in each individual specimen of the moving equine as such. It is this matter that allows an individual animal to move equally on its own feet, as well as on the platform of a vehicle, both without difference. Conversely again, deprived of its local matter, an animal would not be able to move in either of these ways—equally indiscriminately.

209 This unspoiled and pristine form of movement only manifests in the case of the celestial orbs of the supralunar sphere—pure solids provided solely with tiers of intelligible and local matters (matters for alteration and growth and diminution being virtually 'mortified' due to the absence of matter for generation and corruption, see above, n. 108).

multifarious accidental qualities as well as global contingency in the interrelationships of sublunar objects as such: for it is precisely in virtue of accidental multiplicity and variability that an originally ordered, clean and tidy relationship of considerate non-encroachment on the spatial property and the moving corridors of neighbouring individuals (conditioned only by intelligible and local matters, hence circular by default) eventually turns into the chaos of all possible deviations, incontrollable 'clinamina' and chance collisions ('contingencies' = 'touchings together').[210] As in the vicious circle of ever-increasing entropy, collisions cause alterations,

210 What collides in physical space are actually solids, the nonsensible, transcendental nuclei made out of intelligible matter alone, and not the lumps (ὄγκοι) of sensible matter 'surrounding' them, which are themselves liable to change—loose, porous, penetrable and inherently non-solid (see below, n. 215). The stable and impregnable spatial identity of a τόδε τι resides solely in its intelligible solid core, not in its volatile body mass (or the 'bulk' of it). This is why the law of identity (which is a logico-ontological precondition of the very possibility of collision as such) would only concern this nonsensible solid armature of a substance, and not its sensible corporeality. Indeed, 'two solids cannot occupy the same space' (δύο ἅμα στερεὰ εἶναι ἀδύνατον, *Met.* XIII 2, 1076b1; III 2, 998a13–14; cf. *Phys.* IV 1, 209a6–7; IV 5, 212b25). As much as this is an absolutely indisputable truth when applied to two solids, nothing yet prevents the complete spatial overlap of an intelligible solid (στερεόν) and a sensible body (σῶμα). That *the solid and the body occupy the same space at the same time* is not only possible, but absolutely necessary, insofar as the solid is nothing other than the actually inseparable—if potentially and theoretically separable—*material layer* of substance. A nonsensible solid constitutes the pure eidetic identity of a sensible body, which in turn is the sole authorised owner of its own identity. Being *essentially complementary* (matching like scabbard and sword), the two cannot exist in actual separation: they logically and ontologically presuppose each other. This means above all that the solid cannot be a separate 'intermediary' in the Platonic sense (*Met.* III 2, 28–30; XIII 2–3). For the solid is not inherent in its substance *as yet another, actually separable substance* (which would gainsay the law of identity), *but as just one among material layers* within a multilayer fabric of the whole, the one which is (like each of the others, locomotor, quantitative, qualitative and existential) only potentially and theoretically separable from the remainder, while actually impossible to sunder apart from the organic unity of a τόδε τι. *Being made of a single matter and not of a single substance*, the solid is therefore only separable *materially* (ὑλικῶς, i.e. potentially and theoretically—as just one material layer of substance), and not *substantially* (οὐσιαστικῶς, i.e. actually—as yet another substantial whole, composed of an otherwise insoluble fabric of all the material layers). The task of intelligible matter thus consists in the preliminary ('schematic') delineation and isolation of a portion of pure space, the definition of the space-filling unit of a nonsensible solid, surrounded on all sides by a webwork of pure points, lines and planes, and perfectly tailored to suit—or, rather, to impose—the optimal, default size of a sensible body destined to become within (as well as slightly outside) its boundaries (cf. *Phys.* IV 1, 209a4–18). '[T]he space is also somewhere, not in the sense of being in a space, but in the way the boundary is in what is bounded' (καὶ ἔστιν ὁ τόπος καὶ πού, οὐχ ὡς ἐν τόπῳ δέ, ἀλλ' ὡς τὸ πέρας ἐν τῷ πεπερασμένῳ, *Phys.* IV 5, 212b27–28). Yet, although potentially and theoretically separable, this pre-sensible portion of delimited, defined space

while alterations (combined with other accidental changes) generate new aberrations, eccentricities, and further chain collisions.[211] Yet again, one

can never exist as a real *void* (κενόν), i.e. in actual separation from the sensible body which 'infills' it (*Phys.* IV 7–8).

Here is the place to raise a significant point of note once made by Husserl: 'I have not hitherto launched an investigation into the fundamental distinction, already noted by Euler, between the expanse of a thing, as its property, which moves together with the movement of the thing, and the place, which remains left over, even when the body has moved away; and the place pertains to space. I "abstract" the expanse of the body as a property, just as I do with the other concepts of properties; the abstraction of the concepts of place, space, and the like is carried out quite differently' (Husserl 1997, 324 = Husserl 1973, 362.7–14). The latter type of abstraction would certainly be carried out from a sensible space, yet without taking into account any substances (bodies or 'things') therewithin: it would in fact be an abstraction from a non-substantialised, non-solidified part of the sensible space—a spatial area not occupied and impregnated by εἶδος, so shapeless and uninformed. On the other hand, the abstraction of 'the expanse of the body as a property' (that is, of the solid within the body) would not properly concern the space as such, but the substance within the space: hence it would be an abstraction from a certain already substantialised, solidified part of the sensible space—the spatial area previously occupied and impregnated by εἶδος, and thus shaped and informed: the theoretical drawing away of a spatial εἶδος from the sensible substance (that is, from the body or 'thing'). Spatial movement of a shaped and informed, intrinsically solidified substance, its change of place (which the substance owes specifically to its local matter), unfolds therefore against the background of a free, non-designated, shapeless and uninformed sensible matter, in the ambience of a non-substantialised, non-solidified space. Thus, in response to Husserl's dilemma, one could argue that it is precisely the solid ('the expanse of a thing', the impregnable eidetic kernel of a sensibly materiated substance) 'which moves together with the movement of the thing' (such a spatial movement being otherwise made possible only by local matter); whereas 'the place, which remains left over, even when the body has moved away' would be the bare sensible ambience, still undefined, undesignated and unarticulated into substance, not occupied and impregnated by solid, and therefore shapeless (yet not actually 'void' of a free and uninformed sensibility of its own). Accordingly, what makes possible the deployment of 'the expanse of a thing, as its property, [...] together with the movement of the thing' is precisely the fact that 'the place, which remains left over' *is not itself 'expanse'* (i.e. solid = founded on, or made out of, intelligible matter), because this would be at variance with the law of identity.

Thus, while the result of the theoretical abstraction from the sensible body would be a pre-sensible solid made of intelligible matter only ('the expanse of a thing, as its property'); 'the abstraction of the concepts of place, space, and the like' would amount to the theoretical drawing away from the 'amorphous', i.e. free and unbound, non-substantialised, non-solidified remainder of sensible matter (= lacking any intelligible matter within its reach). Therefore the result of this latter abstraction will be precisely the pre-sensible *void* (which is certainly not the property of aught). Now for Aristotle, as we have seen, the void is an impossible notion (which, being inherently contradictory, even challenges the theoretical abstraction itself). Instead of the void, Aristotle speaks of an absolutely uninformed (non-substantialised) matter, πρώτη ὕλη.

On the difference between space and place, see below, n. 240.

211 Thus the quality of weight—to name just the most characteristic and perhaps paramount 'clutter generator'—will immediately affect the very basic feature of locomo-

should never lose sight of the simple fact that matter as such—as *causa materialis*—is not and cannot be the immediate cause of any change. This role only belongs to various forms of *causa efficiens*. Matter for alteration amounts, like any other, to a merely passive aptitude to alternate between contraries—whereas it is the other, foreign substances as such which are the real authors of alteration, and this precisely due to their largely incalculable, wayward mobility and proclivity for more or less fortuitous collisions, inherent in the sublunar condition.[212]

4) *Matter for growth and diminution.* The possibility of changing the opposites of small and large[213] involves the existence of a certain average, normal value of the quantity, the reference value whose relative excess produces growth, whereas its relative shortage leads to diminution. Such value, however, remains in itself mystical, apophatic: 'neither small, nor large'.[214] Being absolute and invariant, this negative standard of spatial ex-

tion by changing it from circular to rectilinear, viz. 'vertical' or 'top-down' (with the most diverse intermediaries created by the various crossings of both types, cf. *Cael.* I 2, 268b17–18), therefore affording a pretext for countless vortices and chain collisions (cf. *Phys.* VII 2, 243a3 ff.; *Cael.* II 8, 290a35–b8; II 13, 295a25–29).

212 On the essential inability of local matter to serve as an originative source of locomotor change, see above, n. 208. It should be noted that not even intelligible matter is anything more than a passive substrate or subject of the corresponding movement attached to it. We have defined this (paradoxically 'static') movement two-sidedly: as the 'arithmetical' movement of logical division (descent to infima species), and as the 'geometrical' movement of spatial individuation, exiting into pure pre-sensible space (including the consecutive 'static movement' of ascent to a perfect solid). However, neither of the movements was actually originated from intelligible matter itself: the one (descending) being the result of a sort of 'gravitational inertia' of self-specification, inherent in logical division as such (see above, n. 163); the other (ascending) being catalysed by some foreign efficient cause, normally extrinsic to the material substrate to be affected (e.g. one parent's semen as a trigger for the spatial individuation of a biological species dormant in other parent's egg; or the noetico-poetic pursuit of a τεχνίτης centred towards an amorphous heap of bricks and wood destined to become a house; or towards a piece of unworked marble destined to become a sculpture, cf. *Met.* VII 7, esp. 1032b15–17).

213 The passage in *Cat.* 6, 5b11, explicitly rules out the possibility of considering the opposites of small and large as contraries (the opposition between them being actually interpreted as relation, although in the section on relation even this condition is further limited, *Cat.* 7, 6b24–27). However, in the salient passage from *Met.* VIII 1, 7, the small and the large are presented as a pair of contraries proper, and classified among other accidental changes (movements). That is why, this time, a middle term τηλικόνδε ('of such-and-such a size') is tacitly introduced; on which see the following note.

214 ἐν πάσαις γὰρ ταῖς ἀντικειμέναις μεταβολαῖς ἐστί τι τὸ ὑποκείμενον ταῖς μεταβολαῖς, οἷον ... [τῇ] κατ᾽ αὔξησιν [μεταβολῇ] ὃ νῦν μὲν τηλικόνδε πάλιν δ᾽ ἔλαττον ἢ μεῖζον, '[F]or in all the opposite changes there is some substrate of changes, e.g. [...]

tension, necessarily involved in any and every species of both the animate and inanimate worlds, obtains its most appropriate expression in the algorithm for generating a given solid, not indeed in the relative and variable values occurring in all possible accidental instances of small and large and their 'intermediaries'.[215] If, for simplicity, we label this setpoint value of

if the change is about the increment—what is now *of such-and-such a size*, then again smaller or larger' (*Met.* VIII 1, 1042a33–36). The τηλικόνδε ('of such-and-such a size'), smuggled in here as a sort of default benchmark for 'smaller' and 'larger', is in fact only a cataphatic variant of the locution 'neither small, nor large', that is to say = 'exactly as large as it is needed', 'just the right size' (cf. ὅπου μὲν οὖν δοκεῖ μὴ εἶναι ἀφελεῖν ἢ προσθεῖναι, τοῦτο ἀκριβὲς τὸ μέτρον, X 1, 1052b36). Aristotle seems to have in mind the *standard quantities* (κυρίως ποσά, καθ' αὑτὰ ποσά, *Cat.* 6, 5a38; 5b8–9), which he contrasts with the *accidental* ones (κατὰ συμβεβηκὸς ποσά, *Cat.* 6, 5a39; 5b10): εἰς ταῦτα γὰρ [= κυρίως ποσά] ἀποβλέποντες καὶ τἆλλα ποσὰ λέγομεν ... ὥστε μόνα κυρίως καὶ καθ' αὑτὰ ποσὰ λέγεται τὰ εἰρημένα, τῶν δὲ ἄλλων οὐδὲν αὐτὸ καθ' αὑτό, ἀλλ' εἰ ἄρα κατὰ συμβεβηκός (*Cat.* 6, 5a39–b10; see also *Met.* V 13, 1020a14 ff.).

215 Aristotle distinguishes between two types of quantity (ποσόν), which he defines as 'that which is divisible into constituent parts' (διαιρετὸν εἰς ἐνυπάρχοντα). The two types are: a) discrete or numerically calculable quantity (ἀριθμητὸν ποσόν), which is called plurality (πλῆθος)—a quantity potentially divisible into discontinuous parts lacking position with respect to each other; and b) continuous or measurable quantity (μετρητὸν ποσόν), labelled size or magnitude (μέγεθος)—a quantity potentially divisible into continuous parts holding position with respect to each other (*Met.* V 13, 1020a7–11; *Cat.* 6, 4b20–24). Geometrical entities—line, plane and solid—can be viewed under both of these aspects. Considered as discrete quantities, line, plane and solid appear as 'numbers' (ἀριθμοί), atomic units of a 'determinate plurality' (πεπερασμένον πλῆθος), indivisible in themselves as well as devoid of common, shared terms. Again, construed as continuous quantities, *the same* line, plane and solid emerge as infinitely divisible, their parts being linked up by some common and shared terms, and they themselves ultimately identified as length (= continuous line), breath (= continuous plane) and depth (= continuous solid), see *Met.* V 13, 1020a11–14; V 6, 1016b26–29; *Cat.* 6, 4b22–5a37; *Cael.* I 1, 268a6–8 and 268a27–29. It is therefore clear that line, plane and solid as indivisible units would come under the sole competence of intelligible matter; whereas it is only at the level of sensible matter—precisely, matter for growth and diminution—that they would acquire the properties of continuous and divisible beings. Hence *one and the same* line, plane or solid respectively, a) if seen from the point of view of matter for quantity, appears as relative and variable, divisible and susceptible to increase and decrease; whereas b) if considered from the point of view of intelligible matter (= πλήθει, cf. *Cael.* III 1, 299b1 ff.)—that is to say, as a reference standard unit of one-, two-, or three-dimensionality respectively—presents itself as absolutely invariable, indivisible (cf. *Met.* XIII 3, 1077b19–20), and not subject to any quantitative change (= 'neither small, nor large', but 'exactly as large as it is needed'—'just the right size'; cf. *Met.* X 1, 1052b31–33, where the length of the foot, ποδιαία, is arbitrarily chosen to represent an indivisible unit in the dimension of length: χρῶνται ὡς ἀτόμῳ τῇ ποδιαίᾳ, see also *Met.* XIII 3, 1078a19–20; XIV 2, 1089a22–23; *An. Pr.* I 41, 49b35–36; *An. Post.* I 10, 76b41–42;

'not small, not large' with *x*, then each 'small', in the case of various individual specimens of a species, would ultimately amount to 'smaller than *x*'; each 'large' to 'larger than *x*'; while the reference value of *x* itself would remain mystically ineffable (except in terms of the construction formula or equation).[216] The ultimate guardian and guarantor of this absolute

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cf. also Plato, *Tht.* 147d; see Acerbi 2008, 124; Gaukroger 1980, 192–93). So when an arithmetician considers man as an indivisible unit (ἓν ἀδιαίρετον), whereas a geometrician entertains him as a solid (στερεόν, *Met.* XIII 3, 1078a24–26; see above, n. 119), then it should be kept in mind that both mathematicians view man as a discrete quantity—as an absolute and indivisible *unit of three-dimensional spatiality* of man, constituted so far only at the level of pure intelligible matter (the entire context of *Met.* XIII 3, 9 indicates that στερεόν and ἓν ἀδιαίρετον are to be understood as fundamentally equivalent—that solid is to be taken as *the unit of three-dimensionality*, *the atomic unit of space filledness*, *a kind of 'space ποδιαία'*; cf. *Met.* V 14, 1020b2–8: στερεόν as both ποσάκις ποσάκις ποσόν and ὃ ἅπαξ).

Justin Humphreys is certainly mistaken in associating discrete quantities with arithmetic, and 'finite continuous quantities, such as lines and circles' with geometry (Humphreys 2017, 202; similarly Gaukroger 1980, 192, and White 1993, 179–80). The real bifurcation here is not into arithmetic and geometry, but into mathematics (as arithmetic-cum-geometry) and physics (see *Phys.* II 2, 193b22–194a12). Since lines and (areas of) circles can be observed both *qua* continuous and *qua* discrete quantities (cf. *Met.* V 13, 1020a11–14), physics and mathematics will treat them, each according to its own specific competencies, either *qua* measurable magnitudes (i.e. constituent parts of the sensible body—spatial boundaries), or *qua* numerable units (i.e. constituent parts of the intelligible solid—spatial dimensions). 'Whereas geometry examines a physical line, yet not *qua* physical; optics examines a mathematical line, yet not *qua* mathematical but *qua* physical' (ἀλλ᾽ ἡ μὲν γὰρ γεωμετρία περὶ γραμμῆς φυσικῆς σκοπεῖ, ἀλλ᾽ οὐχ ᾗ φυσική, ἡ δ᾽ ὀπτικὴ μαθηματικὴν μὲν γραμμήν, ἀλλ᾽ οὐχ ᾗ μαθηματικὴ ἀλλ᾽ ᾗ φυσική, *Phys.* II 2, 194a9–12).

216 If labelled as small/large, a particular horse is small/large solely with respect to this absolute horse that is 'neither small, nor large', but 'exactly as large as it is needed'—'just the right size' (cf. *Met.* X 1, 1052b36; *Pol.* VII 4, 1326a35 ff.; *Poet.* 7, 1450b36 ff.; *De An.* II 4, 416a16–17; *PA* II 7, 652a31–33). Although a horse smaller than another horse is small not in direct regard to the reference magnitude of the horse species, but with respect to one or other its individual specimen—yet the latter itself cannot escape the reference to the absolute horse (which defines it as small or large). Otherwise, we fall into an infinite regress. Therefore, a horse smaller than another horse is also, ultimately (though not immediately), referenced to the absolute standard of the horse species: *a horse of normal size*, i.e. a horse that is 'neither small, nor large', but 'exactly as large as it is needed'. The same goes for the relationship between bronze and mathematical circles: only the former can be small and large, while the latter are 'neither small, nor large', but 'just the right size'; which in turn is negative, absolute, non-relative, self-contained, and can be reduced to a construction formula, an algorithm for generating a circle, or to an equation of the circle (= the λόγος of 'just the right size' of the circle). 'These alone are called quantities in the proper sense, all the others being thus called *per accidens*; for looking at them, we also call other ones quantities' (κυρίως δὲ ποσὰ ταῦτα μόνα λέγεται ... τὰ δὲ ἄλλα πάντα κατὰ

spatial extension is no other than intelligible matter, a three-dimensional solid as a canonical shape embedded in each individual specimen of the given species, animate and inanimate alike.[217] Each individual of the

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συμβεβηκός· εἰς ταῦτα γὰρ ἀποβλέποντες καὶ τἆλλα ποσὰ λέγομεν, *Cat.* 6, 5a38–b1). This canonical, standard-sized circle is again quite concretely, *materially* (ὑλικῶς) inherent in any empirical one ('[F]or it has size, but not body', μέγεθος μὲν γὰρ ἔχει, σῶμα δ' οὐδέν, *Phys.* IV 1, 209a16–17), and it is precisely this absolute circle (and not a relative relation between the empirical circles) which ultimately decides that, for instance, the circle of a finger ring should be evaluated as small (undersized), while the circle of a ferris wheel is to be rated as being large (oversized). Cf. also 'foot' from the previous note: here we have in mind the ancient custom of each individual man using his own foot (thumb, hand, forearm, arm, etc.) as the *common canonical measure* (κανών) of length (cf. too the ancient practice of counting a sixth part of the timespan from sunrise to midday, or from midday to sunset, as a unit of time, 'one hour'). See also *Met.* III 2, 27. Applied to the field of ethics, the ποδιαία principle underlies the notorious doctrine of μεσότης, which constitutes the cornerstone of Aristotle's ethics (cf. e.g. *EN* II 6). It is nothing but a philosophical codification of the popular intuition of a sort of 'ethical ποδιαία', classically formulated by the Delphic dictum μηδὲν ἄγαν (= 'follow the measure that is neither small nor large', but 'just the right size'—'exactly as large as it is needed'). The Delphi are themselves the most concrete topographical instantiation of μεσότης, being 'the navel of the world' once defined by the meeting place of two eagles released from the two opposite extremes of the Whole. (Circular as it is, the definition of the middle by the extremes and of the extremes by the middle reveals the essential ποδιαία character of the absolute measure as such.) See below, n. 219.

217 We refer once more to the crucial distinction between μέγεθος and πλῆθος, interpreted respectively as sensible and intelligible quantities (see above, n. 215). *Qua* μέγεθος (μεγέθει), a sensible body is continuous and infinitely divisible into sensible planes, lines and points, each of which being itself infinitely divisible and irreducible to a corresponding quantity unit (for the infinite divisibility of a sensible point and its ultimate irreducibility to an intelligible point, cf. *Met.* III 2, 998a2–4); *qua* πλῆθος (πλήθει), again, an intelligible solid is discrete and finitely divisible into intelligible planes, lines and points, each of which being itself indivisible, representing a corresponding quantity unit (of the 'ποδιαία' type). *Qua* sensible quantities, lines, planes and solids are *delimited parts and measurable segments* of sensible matter, themselves continuous and infinitely divisible; *qua* intelligible quantities, however, lines, planes and solids are *non-measurable boundaries* of sensible matter (in dimensions of length, breadth and depth respectively), themselves nonsensible, discrete and indivisible (cf. *Met.* V 13, 1020a11–14). An attempt at a real (not just theoretical) division of an intelligible solid cannot therefore lead to the factual separation or inner division of its parts, because each of them is in itself an indivisible and impenetrable unit ('ποδιαία'), representing at the same time the inalienable boundary of a sensible body (bodily boundaries being the sole guardians and guarantors of the body's eidetic coherence and identity, see below, n. 292). Each sensible body is thus *at the same time* a) a continuous and infinitely divisible, and therefore penetrable, *qua* sensible quantity, μέγεθος (= at the level of matter for quantity); and b) a discrete and finitely divisible, so *ultimately indivisible*, and therefore impenetrable, *qua* nonsensible, intel-

equine species thus occupies exactly that particular portion of the physical space which is essentially described by this concretely, physically extended shape of an absolute equinity. This is a predefined and pregiven absolute measure of size (valued as low/high as '*x*', i.e. = 'not small, not large') that makes possible the ultimate decision on whether an individual specimen should be evaluated as small or large, undersized or oversized, deficient or overgrown. In virtue of this 'schematic' εἶδος concretely-spatially implanted in each empirical horse, the canonical shape of an absolute horse is (in consonance with the basic purport of Aristotle's ontology) not something that would be spatially extrinsic to a particular specimen of the species.[218] Furthermore, this absolute horse is not only concretely-spatially anchored in each individual animal of the species, but is that to which each particular item ultimately owes its concrete spatial identity as such; this canonical, ideal horse is hence also the most reliable champion and vindicator of the ontological inalienability of the piece of space occupied by the concrete physique of a particular animal: as long as its sensible physicality remains concretely imbued with the transcendental pattern of the horse in and of itself, an individual of the species can claim an absolutely inviolable right over the particular portion of space underlying its individual spatial identity and assigned to it for lifelong use. Thanks to this living standard, which never abandons the individual it occupies with its material (if intangible and imponderable, in fact, *intelligibly-material*) extension, the individual is endued with its own innate and autonomous default value of spatial magnitude accompanying it throughout its lifetime. In virtue of this entirely concrete, physical, spatially extended criterion—the material and yet imponderable 'armature frame' situated in the midst of a sensible body of flesh and bone—an individual specimen of the equine species is now rendered susceptible to evaluation as small or diminished (undersized), now as large or augmented (oversized), now again as 'almost ideally' proportioned (closest to the size of the value *x*).[219]

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ligible quantity, πλῆθος (= at the level of intelligible matter). On the impenetrability of the body *qua* solid (= the sole material layer of substance capable of both causing and resisting a collision), see above, n. 210, and below, n. 240 ad fin.

218 In the manner of a Platonic equinity that has no concrete, spatial, stereometric character, and therefore no concrete physical part in an individual specimen of a species.

219 It is noteworthy that the size of the value *x* could without too much effort be determined in a fairly precise and concrete manner. This competence belongs specifically to the mime artist. The intelligible horse with its intelligible muzzle, mane, back, hips and belly carefully stroked by the mime's palms—being a pure εἶδος (= shape, *Met.* V 8, 1017b23–26; VII 8, 1033b5–6; *Cael.* I 9, 278a14–15) of a horse—proves to be endowed with the most precise and concrete spatial size of a horse in and of itself

If now intelligible matter is that which provides the substance with this canonical measure of its spatial extension, its absolute quantity ('not small, not large');[220] then it is to matter for growth and diminution that the spe-

(the one that is 'neither small, nor large', but 'exactly as large as it is needed'—'just the right size'). It is the movements of the mime's hands that will also most exactly define the concrete spatial size of the absolute cube, the canonical cube in and of itself, as well as the concrete spatial size of the absolute glass, the absolute chair, the absolute tree and the absolute apple plucked from it, as well as many other things observed with regard to the concrete spatial standard of their absolute magnitude. (We still leave room for some hesitation about the spatial motility of the mimed εἴδη. Is the invisible horse still partially sensible, more precisely: is it provided with local matter, and therefore also with temporality? The local motility and temporality of mimed beings are, to say the least, controversial and hinge solely on whether or not we concede local matter to these beings. Cf. below, n. 239.)

220 Also let it be noted that intelligible matter is not only the specialised custodian of the setpoint values in the category of quantity (κυρίως ποσά, καθ᾽ αὑτὰ ποσά, *Cat.* 6, 5a38; 5b8–9; cf. *Met.* V 13, 1020a14 ff.). It is also the layer of matter essentially responsible for the upmost *standards of qualitative attributes*, the so-called *universal accidents* in the category of quality (τὰ καθόλου συμβεβηκότα, so termed by Aristotle's commentators, cf. Porphyry, *In Cat.* 71.21; 71.32–35; 76.12–24 Busse; Ammonius, *In Cat.* 25.10; 26.19; 29.25 Busse; Simplicius, *In Cat.* 44.24; 50.26 Kalbfleisch; Olympiodorus, *In Cat.* 46.3 Busse; Elias, *In Cat.* 145.5; 147.11; 148.33 Busse; Philoponus, *In Cat.* 28.22; 31.25 Busse; Anon., *In Cat.* 6.3 Hayduck; all referring to *Cat.* 2, 1b1–3). Seen in themselves, universal accidents are characterised not only by the oxymoronic feature of absolute unchangeability, but also by the factual absence of the very quality they are standing for—by the total qualitylessness typically distinguishing them from their concrete counterparts realised in matter for alteration, viz. common *particular accidents* in the category of quality which, as is usually said, *inhere* in individual objects. So while a particular accident of whiteness would normally be changeable and variable due to matter for alteration (cf. *Met.* V 14, 1020b10), all the particular variables of white will in turn refer to a certain invariable default value of white, a sort of 'white in general' (cf. τὸ λευκόν ... κατὰ τὸν λόγον, *Met.* XIII 2, 1077b6), which again escapes any change whatsoever: the universal accident of whiteness, in relation to which each particular white will be white to a greater or lesser degree, whereas it itself will neither be more nor less white. *Nor will it actually be white at all*, because as a purely intelligible entity (viz. an ideal, canonical whiteness that is 'exactly as white as it is needed'), it will not be perceived as a sensible quality either (thus being in a fashion also available to the direct experience of a blind man). If matter is, generally speaking, that component of the substance to which accidents as such owe their existence, then particular accidents should definitely rest on the sensible layers of matter (especially matter for alteration); while the universal ones, viz. the uppermost intelligible 'layer' of each particular accident, would have their characteristically detached and isolated seat within the intelligible matter of the same substance. Thus the continuity of the material layers, from the sensible up to the intelligible, would have its natural counterpart in the ascending continuity of the ontologico-logical layers of an accident itself—from the particular layer, enabled by sensible matter, up to the universal, supported by intelligible matter. '[F]or the genera and species of accidents are themselves accidents' (τὰ γὰρ τῶν συμβεβηκότων γένη καὶ εἴδη καὶ αὐτὰ συμβεβηκότα, Porphyry, *In Cat.* 76.23–24 Busse). For instance, while a particular white would be inherent in the sensible matter of an accomplished marble of Hermes; the corresponding universal white—that is to say, the canonical,

cial task of relative variations and deviations with respect to this absolute

invisible white—would consequently inhere in the intelligible matter of a hitherto only conceived (stereometrically projected) 'Hermes in stone', a marble sculpture still to be chiselled away and ultimately released from its stony wrappings. A similar relationship would be that between the particular accident white of the white pigmented field of an accomplished painting by Kandinsky, and the universal accident white relating to the underlying sketch—a pure conception realised in the intelligible matter of the painting—on which the same field is marked by the word 'white', the conceptual, non-pigmentary sign of the concrete physical and spatial presence of a universal accident white, a white in general, a pure intelligible, transcendental, non-sensible white, otherwise totally colourless, invisible, and therefore completely accessible even to the experience of the blind. (Kandinsky thus may deserve the epithet of first inventor of pictorial art for the blind—even those blind from birth—a kind of pictorial alphabet for the blind, equipped with peculiar 'braille colours', universal accidents of the full colour spectrum; this revolutionary art of painting for the blind is indeed quite properly dubbed 'abstract painting', yet in a broader sense it can also be described as *conceptual art* in general.) Be that as it may, the universal accident white (inherent in the intelligible matter of a painting) is *logically contained* in the particular accident white (inherent in the sensible matter of a painting), being a generic determination *predicable* of it: *This white is 'white'* (which is indeed a truncated definition lacking differentia). The predicability of the universal white to the particular white is what actually legitimises the former as a *universal* accident: 'For by saying *some things are predicated of a subject* [= *Cat.* 2, 1a29–b1], he [Aristotle] shows that he is talking about universals; for *predicted of a subject* is an explanatory way of talking about universals (διὰ μὲν γὰρ τοῦ φάναι τὰ μὲν καθ᾽ ὑποκειμένου λέγεται δηλοῖ ὅτι τὰ καθόλου λέγει· τῶν γὰρ καθόλου ἦν ἐξηγητικὸς λόγος τὸ καθ᾽ ὑποκειμένου λέγεσθαι, ibid. 76.12–15). On the other hand, the inherence of (particular, resp. universal) white in the (sensible, resp. intelligible) matter of Kandinsky's painting legitimises the former as an *accident*: 'By saying *are in a subject* [= *Cat.* 2, 1b1] he shows that he is talking about accidents: for these are in a subject. Therefore he says that these are universal accidents' (διὰ δὲ τοῦ ἐν ὑποκειμένῳ εἶναι, ὅτι συμβεβηκότα λέγει· ταῦτα γὰρ ἦν ἐν ὑποκειμένῳ. λέγει τοίνυν ὅτι τὰ δέ ἐστι καθόλου συμβεβηκότα, ibid. 76.15–17). To inhere in a subject while being in the same breath completely deprived of any sensible quality that normally constitutes the essence of the accident as such, these two incompatible and mutually exclusive characteristics inevitably lead to the conclusion that the inherent universal accident (= the unqualified, qualityless accident inherent in intelligible matter) amounts to *a pure privation of the particular accident, as the latter's own entelechy* (= the fully qualified accident inherent in sensible matter).

Insofar as they constitute an obligatory connotative appendage virtually inseparable from the logico-spatial definition of a substance, universal accidents can just as well be qualified as *inseparable accidents* (ἀχώριστα συμβεβηκότα, see above, n. 95). Thus blackness in general would be a kind of inseparable connotative appurtenance of the logico-spatial definition of a raven (a part of the 'apophatic definition' of raven, see above, n. 95). The particular accident is, on the other hand, the one separable by default: the particular blackness of a raven can be replaced by particular whiteness, or by any other particular colouring (through a simple mechanical treatment of the bird's feathers), without the essence—the definition—of the raven being called into question. However, blackness as a universal accident will always and exceptionlessly accompany the logico-spatial definition of the raven, being of its inseparable connotative retinue—of course, to the extent that the accident as such is, and may be,

measure falls. According to the Stagirite, matter for growth and diminution immediately depends on the first above—matter for alteration. Again, a change in quantity is based on an increase in homogeneous body mass (ὅμοιον, 'what is like'), while this increase results from the appropriation and assimilation of the body mass of a foreign, previously heterogeneous substance (ἀνόμοιον, 'what is unlike'). Such assimilation is hence directly conditioned by a change in the original quality of the substance intended to be assimilated.[221] Unlike the alteration which, according to Aristotle,

somehow inseparable; for the inseparability of an inseparable accident is never as absolutely rigorous as that of a conceptual determinant, a differentia specifica: that is why the raven can as well be *thought of* as white (by a kind of capricious theoretical violence over the concept, still without practically affecting its content). At any rate, a universal accident will always be factually inseparable from both the logical as well as the spatial definition of the thing: for not only the abstract, logical εἶδος, but also the concrete, physical and spatial εἶδος of a raven—the pure pre-sensible solid shape (the three-dimensional 'wireframe model') of a this here raven, as well as of each particular raven—is always provided also with a *factually inseparable universal accident* of blackness, a default, absolute blackness, a universal, nonsensible, and therefore normally invisible, blackness in and of itself. See above, nn. 95 and 108.

In addition, we wish to point out that universal accidents generally correspond to the Thomist abstractions of accidents underlain by so-called common matter (*materia communis*), a non-individuated, 'non-designated' matter (*materia non signata*), which, in Aquinas' view, can be both sensible and intelligible. It seems, after all, that the double-sided common matter of Aquinas, sensible and intelligible, can be reduced to the single intelligible matter of the Stagirite, a material layer which, viewed in theoretical isolation, has no share in sensibility, except that (following Porphyry's reading) it can also serve as a substrate for universal accidents in the category of quality (universal accidents, being a special kind of universals, have no sensible but only an intelligible character). According to Aquinas, however, abstract qualities (a subject of physics) would come under the special domain of common sensible matter (unknown to Aristotle's typology), while the corresponding common intelligible matter would be exclusively responsible for abstract quantities, those, that is to say, separated from abstract qualities (a subject of mathematics = πλήθει ποσά, in Aristotelian nomenclature). See Pasnau 2007, 40–42.

221 'It is impossible for the increase to come about if it is not preceded by an alteration: for what is increased is indeed in a way increased by what is like, but in a way also by what is unlike; for it is said that the contrary is food to the contrary. Yet everything that becomes increases by what is like. It is therefore necessary that the alteration be a change from contrary to contrary' (ἀδύνατον γὰρ αὔξησιν εἶναι ἀλλοιώσεως μὴ προϋπαρχούσης· τὸ γὰρ αὐξανόμενον ἔστιν μὲν ὡς ὁμοίῳ αὐξάνεται, ἔστιν δ' ὡς ἀνομοίῳ· τροφὴ γὰρ λέγεται τῷ ἐναντίῳ τὸ ἐναντίον. προσγίγνεται δὲ πᾶν γινόμενον ὅμοιον ὁμοίῳ. ἀνάγκη οὖν ἀλλοίωσιν εἶναι τὴν εἰς τἀναντία μεταβολήν, *Phys.* VIII 7, 260a29–33). 'The whole becomes larger, on the one hand, by acceding of something which is called food and [which is also called] contrary [sc. to the flesh], and, on the other hand, by [the food's] changing into the same form [sc. as that of flesh]; just as if e.g. wet acceded dry, the acceding [wet] would change and become

comes about in the immediate aftermath of the outward contact between two substances, each of which retains its own spatial identity even after a collision; a change in quantity leads to an overall assimilative merging of one of the two substances into the other, and consequently to the loss of its transcendental identity and the ultimate demise of the intelligible matter invested in its interior. Therefore it is no less correct to say that the change in quantity not only brings about a relative and accidental change, the comparative growth and diminution of a sensible body, but also an absolute and substantial change—sensible corruption, necessarily linked to the ontological abolition of an individual instance of a 'mathematical solid'. One thing is certain, anyway: the dissolution of an individual item of intelligible matter (resultant from the assimilative merger of one of the two substances into the other) necessarily entails empirical corruption of an individual item of sensible matter—a substantial change. It now remains to be seen whether the same applies, *mutatis mutandis*, to the reverse process as well: does the transcendental conception of a 'mathematical solid' condition in the same way the empirical birth of a sensible substance?

5) *Matter for generation and corruption.* After all, there seem to be two types of growth and diminution that Aristotle might have had in mind here. Organic growth, as we have seen, results from the ultimate absorption of one substance by another, a process the philosopher describes by his favoured technical term πέψις, 'digestion' (or 'concoction'), tellingly borrowed from the biological (or, more precisely, *chymical*) sphere.[222]

dry: for what is like is indeed in a way increased by what is like, but in a way also by what is unlike' (μεῖζον μέντοι τὸ ὅλον γέγονε προσελθόντος μέν τινος, ὃ καλεῖται τροφὴ καὶ ἐναντίον, μεταβάλλοντος δὲ εἰς τὸ αὐτὸ εἶδος, οἷον εἰ ξηρῷ προσίοι ὑγρόν, προσελθὸν δὲ μεταβάλοι καὶ γένοιτο ξηρόν· ἔστι μὲν γὰρ ὡς τὸ ὅμοιον ὁμοίῳ αὐξάνεται, ἔστι δ' ὡς ἀνομοίῳ, *GC* I 5, 321b35–322a4); also: '[I]t is therefore the principle of incrementation [τὸ αὐξητικόν] inherent in what is increased and what is really *actual* flesh, that made *actual* flesh by acceding of *potential* flesh [viz. food]. The latter, then, being simultaneous with the former' (οὕτως ἐν τῷ αὐξανομένῳ καὶ ὄντι ἐντελεχείᾳ σαρκὶ τὸ ἐνὸν αὐξητικὸν προσελθόντος δυνάμει σαρκὸς ἐποίησεν ἐντελεχείᾳ σάρκα. οὐκοῦν ἅμα ὄντος, *GC* I 5, 322a11–13).

222 On πέψις in the medical field, see Hippocrates, *De vet. med.* 18; Plutarch, *Cons. Apoll.* 102a. 'Digestion is a process effectuated from opposing qualities by means of natural and proper heat' (πέψις μὲν οὖν ἐστὶ τελείωσις ὑπὸ τοῦ φυσικοῦ καὶ οἰκείου θερμοῦ ἐκ τῶν ἀντικειμένων παθητικῶν, *Meteor.* IV 2, 379b18–19; cf. *Prob.* XII 7, 907a18–19: ἀλλοίωσις τοῦ πεττομένου). '[F]or if it is considered to be undigested, food is the contrary which nourishes the contrary; if, however, it is considered digested, it is the like which nourishes the like' (ᾗ μὲν γὰρ ἄπεπτος, τὸ ἐναντίον τῷ ἐναντίῳ τρέφεται, ᾗ δὲ πεπεμμένη, τὸ ὅμοιον τῷ ὁμοίῳ, *De An.* II 4, 416b6–7; for πέψις in the field of nutrition, see e.g. *PA* II 3, 650a3–5; in developing of blood: *HA* III 19, 521a17–18).

One substance is fully 'digested' by another each time it is qualitatively assimilated and quantitatively integrated into the unique and continuous whole of the other.[223] Yet there is still another form of substantial appropriation: that which happens without the mediation of 'digestion' and therefore not affecting the original identity of the substance adopted. This other form creates a sort of inorganic 'agglomeration' (σωρός), which the Stagirite designates by the term 'concretion' (σύμφυσις), or even 'malformation' (πήρωσις), thereby emphasising the 'violent' (βίᾳ) character of its emergence and maintenance, both unsupported by the internal unity of the whole.[224] It is understandable that this external addition to the substance, not being normally and naturally assimilated to its organic bulk, retains quite a degree of autonomy, surviving like a sort of foreign excres-

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For πέψις in the sense of 'generative concoction' or 'ripening', see *GA* I 12, 719a34 (τὸ γινόμενον [= embryo], ὃ δεῖται ... πέψεως); I 12, 719b2 (σπέρματος πέψις; cf. also IV 1, 765b2–3; 765b10–11); IV 6, 775a17 (διάκρισις [= generative *articulation* of the embryo, embryogenesis] πέψις ἐστί); IV 8, 776b35 (π. = 'concoction' of milk stored in the breast). Cf. Odzuck 2014, 196–97; Connell 2016, 100.

223 Aristotle also takes into account the increase that does not entail assimilation (change from unlike to like), so what we have here is the simple mixture of the same (*Phys.* VIII 7, 260a30–31).

224 Aristotle locates the principle of this internal unity of the parts in what he calls 'something in the joints' (τὶ ἐν ταῖς καμπαῖς): it is this 'something in the joints' that is alone capable of putting the parts into organic motion (τῷ ἀρχὰς ἔχειν κινήσεως [sc. τὰ μόρια] ἀπό τινος ἐν ταῖς καμπαῖς, *Met.* VII 16, 1040b12–13). Thus the 'joints' (καμπαί) would operate as a kind of specialised mediation organ through which the motion-giving process of organic incorporation of the parts into the whole is ultimately carried out. Yet they are no less the mediators of the reverse process of separation of the parts from the whole (allowing the parts of certain articulated worms and arthropods to maintain some form of motility even after being cut off from the rest of the body, cf. *De An.* II 2, 413b16 ff.). This is accounted for by the fact that 'the parts of living beings and *the parts of their soul* cohabit side by side, existing both actually [= not integrated into a unique organism] and potentially [= organically integrated therein]' (τὰ τῶν ἐμψύχων ... μόρια καὶ τὰ τῆς ψυχῆς πάρεγγυς ἄμφω γίγνεσθαι, ὄντα καὶ ἐντελεχείᾳ καὶ δυνάμει, *Met.* VII 16, 1040b10–12; for a different reading, see Frede–Patzig II 1988, 300; cf. *De An.* II 1, 412b25–26). Although he most often equates the parts of living beings with substances in the proper sense (i.e. living beings themselves as well as celestial bodies, see e.g. *Met.* V 8, 1017b10–13; VII 2, 1028b9–13; VIII 1, 1042a8–12; *Cael.* III 1, 298a29–32; *PA* II, 1), Aristotle firmly asserts that the animal parts are even more to be considered as 'potencies' (δυνάμεις) because they themselves lack independent substantial existence (οὐθὲν γὰρ αὐτῶν ἕν ἐστιν, *Met.* VII 16, 1040b8–9). The 'concretion' therefore happens whenever there is no appropriate organic conjunction between the parts, each time they are simply agglomerated without proper mediation of the joints, bypassing the joints, that is, without *articulation*, failing to establish *a duly articulated unit* (or, what amounts to the same thing, *an organic unit*).

cence, which does not actually enhance the original quantity of the host substance, since it keeps its own substantial individuality ('actuality') essentially unwelded, unmixed and intact by the adjacent tissue of the alien environment.[225] Such growth is therefore only apparent, hence even the possible elimination of this inorganic appendage would not have the character of diminution proper. It would rather be reminiscent of the optional removal of an artificial limb, which—unlike the ablation of a natural one—does not cause the body to diminish since it never even became an integral part of it and therefore never really contributed to its enlargement either.[226] Although Aristotle is nowhere explicitly concerned with the specific analysis of the mechanism of diminution,[227] it seems that this process, by reverse analogy with the process of growth, could also be viewed in two different ways, each corresponding to one of the two possible forms of generation. For just as proper, natural growth conditions the ultimate corruption of a substance which is integrated into another one by means of assimilation (the growth of one substance is paid for by the corruption of another);[228] so will proper, natural diminution condition the ultimate generation of a substance which separates from another one by means of dissimilation (the diminution of one substance is repaid by the generation of another). However, as we have seen, appropriate, natural growth has its failing counterpart in the form of improper, unnatural growth, a 'concretion' which, strictly speaking, does not lead to an increase proper,

225 Such non-integrated parts of a substance retain their original *actuality* and never become *potential* in the manner of limbs of a unique and continuous organism (cf. *Met.* VII 16, 1040b14–15: δυνάμει πάντ᾽ ἔσται, ὅταν ᾖ ἓν καὶ συνεχὲς φύσει, 'it is potentially how all things will exist whenever they are something one and continuous by nature').

226 Cf. Odzuck's example with an infant swallowing a stone (Odzuck 2014, 46).

227 Ibid. 48.

228 'One might wonder what sort of thing it should be that increases the other thing. It is clear that such a thing should be *potentially* that [sc. which is being increased]: for instance, if it were flesh, it would be *potentially* flesh. *Actually*, therefore, it would be some other thing [than the one which is being increased = for food is other than flesh]: the flesh becomes precisely by the *corruption* of this thing [= of food, that is]' (ἀπορήσειε δ᾽ ἄν τις ποῖόν τι δεῖ εἶναι τὸ ᾧ αὐξάνεται. φανερὸν δὴ ὅτι δυνάμει ἐκεῖνο, οἷον εἰ σάρξ, δυνάμει σάρκα. ἐντελεχείᾳ ἄρα ἄλλο· φθαρὲν δὴ τοῦτο σὰρξ γέγονεν, *GC* I 5, 322a4–7). The implication is therefore reciprocal: the ontological condition for increased body weight (viz. newly emergent flesh) is the substantial change ('corruption') of the food that enters the body and becomes substantially altered by digestion. '[F]or the corruption of one of a couple is the generation of the other' (ἡ γὰρ θατέρου φθορὰ θατέρου ἐστὶ γένεσις, *Met.* II 2, 994b5–6). For the 'generative principle' (τὸ γεννητικόν = ὕλη γεννητή) as the ultimate trigger for quantitative change, cf. *De An.* III 9, 432b8–11.

since the additional quantity is not 'peptically' assimilated into the whole, and consequently—not actually integrated into it—it cannot affect a natural change in its size either. For what, seen in this light, would a natural diminution mean, and what again one perpetrated counter to nature? If each diminution entails the separation of a part from the whole, a natural separation should no doubt involve somehow the participation of the same organ that has already been operational in the process of natural growth—the organ of 'peptic' modification.[229] An unnatural diminution, in contrast, would circumvent this organ altogether, so the separation of a part from the whole would be performed without this regular mediator, viz. *peptically unmodified*, undigested, and therefore 'violently' and arbitrarily, with no method involved: the change in quality (alteration), although once again no less necessary a prerequisite for change in quantity (diminution), would not have been implemented in a regular and natural manner.[230] The whole process would therefore take the form of an irregular and fortuitous dissimilation. The separation resulting from this kind of random and chaotic, methodless dissimilation would hence largely correspond to what Aristotle otherwise calls mutilation.[231] This is in principle understood as a diminution which does not involve any essential, viz. vital threat to the whole, since the substance continues functioning unfailingly in spite of the loss of an 'extremity' (ἀκρωτήριον, be it a limb of a man or a projection of a vase).[232] On the other hand, such a diminution—an inorganic detachment of the part from the whole—does not establish anything that could have the character of a unique and self-sustained thing: it turns out that the mutilated extremity is in fact not, and cannot be, any substance, or part of a substance, which is best reflected in the fact that the alienated fragment proves absolutely unstable and incapable of any independent existence, an otherwise fundamental and necessary condition of substantiality in its core meaning. The severed hand[233] cannot survive as

229 Expressed in terms of 'joints' (see above, n. 224), natural diminution, as a process 'laterally symmetrical' to natural growth, the proper addition of parts to the whole, would imply that the whole is decomposed *articulatim*, i.e. that the parts are separated *at the joints* and not past the joints: disassembled ('dismantled') in a prescribed, methodical manner.

230 'An example of this would be a part of flesh that is detached from the living tissue and that by this process ceases to be like the actual flesh of the body and turns into some other material that is transported out of the body after the change' (Odzuck 2014, 48).

231 On mutilation (κολοβὸν εἶναι), see *Met.* V 27.

232 ἀκρωτήριον λέγεται πολλαχῶς!

233 Odzuck's instance of the 'chopped off hand' (Odzuck 2014, 48, n. 22) is probably inspired by *Met.* VII 11, 1036b30–32: οὐ γὰρ πάντως τοῦ ἀνθρώπου μέρος ἡ χείρ, ἀλλ'

a substance, nor as a part of a substance, and is therefore generally subject to rapid decomposition and irreversible transition to the inorganic, or furthermore—to the non-thingish, identityless and nameless. The same goes for any discarded 'extremity' of a mutilated artifact—any fragment which, proving to be dysfunctional, lacking in substantiality, inevitably ends up in the amorphous and anonymous 'first matter' of the city dump.[234] Mutilation as an inappropriate diminution leads thus to a kind of fake generation: it is actually a *birth of waste* (which is a *miscarriage* by default).

So we come to another form of diminution, that appropriate and natural, underlying generation in the most eminent sense of the word—a generation *par excellence*: the birth of a new individual of the species. For generation indeed is only the natural outcome of a specific and, in a sense, the only appropriate form of diminution: weight loss as a consequence of the delivery of a new living body. We have seen that any change in quantity is at bottom introduced by alteration as a *sine qua non* of both growth and diminution alike. Even an unnatural diminution cannot bypass a certain form of alteration. The alienation of a part of living flesh from the remainder of the organic tissue necessarily involves the change of its substance from organic to inorganic. Failure to alter would in fact disable the alienation itself: a qualitatively unchanged stuff would normally remain an integral part of the whole, still solidly incorporated in its organic unity and continuity, so that no quantitative change in the whole could possibly occur either. Such a change would only have been possible under the previous condition of decay of organic tissue. After (or during) the surgical procedure, the quality of the tissue undergoes a change: it alienates itself from the surrounding tissue by altering its own quality, thus creating a crucial precondition for the separation from the rest of the body and the eventual change in the amount of the whole. On the other hand, the delivery of a living body, which in its own way also eventuates in change in quantity ('deballasting'), that of the parental substance—by alienating part of it from its substantial bulk—is conditioned by a funda-

ἡ δυναμένη τὸ ἔργον ἀποτελεῖν, ὥστε ἔμψυχος οὖσα· μὴ ἔμψυχος δὲ οὐ μέρος. Cf. *Met.* VII 10, 1035b23–25: οὐδὲ γὰρ εἶναι δύναται χωριζόμενα· οὐ γὰρ ὁ πάντως ἔχων δάκτυλος ζῴου, ἀλλ' ὁμώνυμος ὁ τεθνεώς. Cf. also *Pol.* I 2, 1253a20–25: τὸ γὰρ ὅλον πρότερον ἀναγκαῖον εἶναι τοῦ μέρους· ἀναιρουμένου γὰρ τοῦ ὅλου οὐκ ἔσται ποὺς οὐδὲ χείρ, εἰ μὴ ὁμωνύμως, ὥσπερ εἴ τις λέγοι τὴν λιθίνην· διαφθαρεῖσα γὰρ ἔσται τοιαύτη. πάντα δὲ τῷ ἔργῳ ὥρισται καὶ τῇ δυνάμει, ὥστε μηκέτι τοιαῦτα ὄντα οὐ λεκτέον τὰ αὐτὰ εἶναι ἀλλ' ὁμώνυμα. Cf. *GC* I 5, 321b31–32; *GA* I 19, 726b22–24.

234 Disintegration is a downright consequence of the absence of intelligible matter (schematic reinforcement), as a connective, organicising, articulating and individuating factor of bodily unity.

mentally different type of alteration. Now it is quite easy to see that this alteration is really nothing other than simple *fertilisation*. Here it should be recalled once more that it was the very *conception*, hitherto only considered in terms of intelligible matter (in 'transcendental isolation'), that was to mark the first exit of the logical unit (μονάς) into physical space, the establishment of the spatial point (στιγμή), and further still, by a kind of inherent schematic development, of the complete mathematical solid. This conception was both geometrical and biological at once. The biological aspect of conception is particularly emphasised by the fact that the role of efficient cause was assigned to the natural semen of the male parent—a fairly biological catalyst for generation. Consequently, it seems reasonable to say, the transcendental schema inherent in a new individual of the species (notwithstanding the logico-ontological priority of the intelligible matter constituting the schema) was from the outset inseparably linked up with matter for generation, and through it to the whole remainder of sensible matters—matter for growth, alteration and locomotion (as well as temporality). For the generation of a geometrical solid, albeit *logically prior* to that of a biological zygote, did not preclude the latter from developing simultaneously *in the usual time sequence* as well:[235] the logico-ontological establishment of a spatial point amid the fertilised egg was at the same time temporally followed by a qualitative change in the egg's substance; so within the substance of a parent, the other one, that of the child, was *conceived*: the altered quality of the substance of the egg, which from unfertilised became fertilised—a natural consequence of a kind of reverse πέψις (since fertilisation turns out to be something like *digestion inversely mirrored*)[236]—created a situation in which two different (quantitatively, qualitatively, locomotively-temporally[237] as well as spatially-schematically

235 Ultimately due to local matter, see above, nn. 180, 181 and 206.

236 Digestion as such ensures the natural, 'non-violent' character of normal metabolic transactions, be they integration or separation, ceasing to exist or coming into existence. It is by digestion that one substance (food) integrates into another (body) and thereby ceases to exist; while it is by 'reverse digestion' (fertilisation) that one substance (egg, originally—while still 'undigested', unfertilised—fully and continuously integrated in the mother's body) separates from another (being first transformed into an embryo, which is only partially and discontinuously related to the remainder of the mother's body), and thereby comes into existence (being delivered and fully emancipated from the mother's body). On intrauterine development (διάκρισις, 'separation') as a kind of digestion, cf. *GA* IV 6, 775a17–18 (ἡ γὰρ διάκρισις [= intrauterine development] πέψις ἐστί).

237 We are thinking here of the autonomous locomotor motility of an embryo, which is relatively independent of the equally autonomous locomotor motility of the parental substance (maternal locomotion and embryonic locomotion in the mother's womb

distinguished) substances—the substance of the mother and the substance of the embryo formed from the fertilised egg—started to cohabit in the same body for a certain period of time. Finally comes the moment for the reduction of the pregnant body: one part of it leaves the whole. Yet this time, the part is not just a non-substantial 'extremity' of a mutilated whole, but a completely new substance, a new substantial whole ontologically equivalent to that which it itself 'deballasted' by its departure.[238] It is self-sufficient, autonomous, defined by the absolute measure of its own species, the specific shape inscribed in an inalienable piece of space that was already granted for lifetime use at conception. In addition, it is also spatially mobile, embedded in real time, capable of receiving and changing qualities, subject to increase and decrease.

And contrariwise, having once dismissed all the aforesaid properties based on sensible matter; having in addition unbuilt the very transcendental schema and disposed of the invisible wireframe fence that staked out its private plot of space; the substance is eventually ready for the complete cessation of existence and the final retransition (ἀντιμετάβασις) back to the previous state of purely logical, pre-spatial givenness as an infima species (secondary substance, logical 'memory', μνήμη, or 'science', ἐπιστήμη).[239]

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unfold essentially independently, originating from two unlike substances). As a result, parental and embryonic substances are also distinguished in time: each endued by its own individual timing. The age of one is measured in years and decades, and the age of another in hours, days, weeks and months.

238 This should be emphasised: what this time leaves the parental substance is not a *part* of it (like the mobile or immobile extremities dissociated from the substantial bulk) but something which itself has become in the meantime a self-sufficient and self-sustained *substance*.

239 As is known, Aristotle leaves open the possibility that the individual soul, yet not the whole, but only the intelligible part of it (viz. νοῦς, which is a form, an εἶδος, of human substance), survives after the final destruction of the sensible body: 'Whether something remains after [death] is worth speculating about; for in some cases, nothing prevents this: the soul e.g. would be something like that, not the whole, but the intelligible part of it [ὁ νοῦς]: because it is perhaps impossible for the whole of it to survive' (εἰ δὲ καὶ ὕστερόν τι ὑπομένει, σκεπτέον· ἐπ᾽ ἐνίων γὰρ οὐθὲν κωλύει, οἷον εἰ ἡ ψυχὴ τοιοῦτον, μὴ πᾶσα ἀλλ᾽ ὁ νοῦς· πᾶσαν γὰρ ἀδύνατον ἴσως, *Met.* XII 3, 1070a24–27; *De An.* II 2, 413b26–27; III 4, 429b5; III 5, 430a22–23). This could mean that man is the only substance whose ὕλη νοητή, the material substrate of ψυχὴ νοητική (= νοῦς), is capable of surviving the collapse of other (that is, sensible) material layers, which occurs after individual death (the disappearance of the sensible body and ψυχὴ αἰσθητική, normally supported by sensible layers of matter). This would of course imply that the posthumous ψυχὴ νοητική continues to subsist in the form of a concrete *genius loci*, that is to say, to continue to occupy a certain inalien-

7.10.2 Leafing through the pages of the anatomy book of nature

able and inviolable portion of the pure nonsensible (transcendental) space (cf. Plato, *Phd.* 81c–d, with a quaint tinge of folkloric flair); which would ultimately allow the Stagirite to remain faithful to the traditional Homeric depiction of the underworld shades (νεκύων ἀμενηνὰ κάρηνα), which—being concretely spatial—are, indeed, easily pointed out with the finger, yet—being nonsensible—entirely impossible to grasp with the hand:

> αὐτὰρ ἐγώ γ᾽ ἔθελον φρεσὶ μερμηρίξας
> μητρὸς ἐμῆς ψυχὴν ἐλέειν κατατεθνηυίης.
> τρὶς μὲν ἐφωρμήθην, ἐλέειν τέ με θυμὸς ἀνώγει,
> τρὶς δέ μοι ἐκ χειρῶν σκιῇ εἴκελον ἢ καὶ ὀνείρῳ
> ἔπτατ᾽.
>
> (*Od.* XI 204–208)

Here we will allow ourselves a bit of interpretive freedom by reading μητρὸς ψυχὴ κατατεθνηυίης as intelligible matter itself (= the 'maternal', that is, conceiving/exteriorising/stereometrising layer of substance) seen in its transcendental (= after- and pre-life, i.e. pre-sensible) isolation; τρὶς ἐλέειν would accordingly refer to the three-dimensional *perception* of such an isolated ὕλη νοητή, or, even more concretely, to the progressive three-phase movement of grasping it ἐν μήκει καὶ πλάτει καὶ βάθει, expectedly frustrated due to an insatiable deprivation of 'blood'—the transcendental separation from sensible matter (wherefore, as said, it proves possible to point it out with the finger, or even circumambulate its spatial aura, and yet impossible to grasp any of its dimensions, either separately or all three at once). (The peculiar motif of the failed triple attempt to seize the nonsensible εἴδωλον of the deceased solidifies as a topos later in the epic, although the crucial maternal element is generally absent, cf. e.g. Virg. *Aen.* II 792–794; VI 700–702; Dan. *Purg.* II 79 ff.; see Gragnolati 2007, 122–23; Villa 2012, 9; in Homer, cf. also *Il.* XXIII 99–100.)

However, the Homeric example poses yet another problem to which Aristotle does not seem to have given an explicit answer. If the survival of the intelligible part of the soul is not to be questioned, does this imply that the death of a human abolishes *all* the remaining layers of matter, which would, then, already include the first following beneath the intelligible, namely local matter (see Ross 1923, 167), and, along with it, any temporality as well? The mobility of the Homeric shades, however, seems to prove that their ὕλη τοπική has not entirely disappeared alongside the rest of sensible materiality (no matter how much such mobility leaves the impression of a non-spontaneous, 'phoretic' movement, similar to the weightless hovering and wafting of the dangle-legged figures in a shadow theatre, as well as, indeed, to the rigid gait of the horse on wheels, led by the child's hand; this stiff type of 'divine movement' is characteristic, of course, chiefly of the celestial orbs, see *Cael.* II 4, 287a23–24; II 6, 288a13; *Met.* XIII 3, 1078a12–13; as for the pure νοῦς, it is in fact not capable of initiating a movement on its own, *De An.* III 9, 432b26–27; cf. above, n. 110). Such *pure locomobility* would therefore be accompanied by an equally *pure temporality*, the latter as a kind of peculiar compromise between a) bare *atemporality*, i.e. eternity as a divine mode of existence in the extrahistorical dimension of a stopped and rounded, completed (actually, even never-incepted) time (see above, n. 182); and b) typical human *temporality*, with its historical peculiarity, that is, successiveness and permanent incompleteness: this compromise creates, then, a kind of capacity for static (synchronistic) perception of a completed and perfected time that simultaneously retains all of its historical (diachronic) perspective, expressed in its triple successive structure: before–now–after. Such an otherworldly compromise resulting from the intersection

shows that the closest relationship of logico-ontological dependency subsists between all the adjacent overlays: each upper represents a necessary condition of the lower, whereas each lower depends directly on the first above and indirectly on all superiors:

1) *Intelligible matter* as *matter for spatial extension* allows individuation, the setting of the individual pre-sensible solid in three-dimensional space; and then, *eo ipso*, its multiplication, establishing a whole class of pre-sensible solids of the same species—thus creating a necessary condition for locomotion;[240]

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of divine synchrony and human diachrony eventuates, then, in the characteristic *ability of divination*, the privilege of the prophets and the dead (as being composed solely of intelligible and local matters) to optionally walk back and forth through the flux of time as through a series of rooms in a gallery of an *eternalised history*. This frozen flow of historical time is thus displayed as a kind of spatial succession of *events* which, being paradoxically static and fixed like an endless array of historical tableaux vivants, neither really 'happen' nor 'progress', their (that is: *eventual*) outcomes being always potentially known as completely as all their prehistory (cf. *Cat.* 6, 5a27–30: time as 'discrete quantity'—'order', rather than 'duration': μᾶλλον τάξιν τινὰ εἴποις ἂν ἔχειν [sc. τὰ τοῦ χρόνου μόρια] τῷ τὸ μὲν πρότερον εἶναι τοῦ χρόνου τὸ δ᾽ ὕστερον, cf. the following note).

240 Intelligible matter is matter for occupying space (spatial extension), and local—matter for occupying a place in space (localisation) as well as for changing place in space (locomotion). These two—spatialisation and localisation—should therefore not be confused with each other, although they are most closely related to each other. For occupying space is not the same as occupying a place: the former does not imply the latter, although the latter logically and ontologically presupposes the former. Being spatialised is still a purely intelligible, pre-sensible property of things (their pure *nebeneinander*, to put it in the Kantian fashion), whereas being localised is already a sensible property (things' *unter-* and *miteinander*). As far as intelligible matter is concerned, the only task specifically entrusted to it, and to it alone, is the simple constitution of a solid as a spatial unit—and consequently of a whole multitude of units of the same class (πλείω καὶ ἄπειρα ὄντα τὰ ὁμοειδῆ, *Cael.* I 9, 278a19–20). Yet these pure spatial units—the pure solids of the same class—are not at all already localised in themselves; for they acquire this property only by falling under the authority of local matter, which is indeed the first next among the material layers, and the highest of the sensible ones. Therefore the pure solids certainly do occupy some concrete physical space, yet they do not occupy any concrete physical place in the concrete physical space they occupy: they are fully spatialised, and yet not at all *eo ipso* localised. Though spatialised, they are hitherto neither localised nor locomobile. This again, strictly speaking, means that there is still neither any spatial distance between them, nor locomotion by which such distance would change, increase or decrease. (And conversely: the total absence of locomotion would normally neutralise the very distance between the loci, and ultimately the very existence of the loci as such.)

Local distinctions are thus only introduced by means of local matter, the first in a descending series of sensible matters: therefore these distinctions as such have a sensible character—the character of the spatial distances between two and more distinct

2) *Local matter* allows locomotor mobility (and hence temporality) of

places in space. While the spatial distances between sensible bodies are sensible, having the character of μέγεθος, or a continuous size, which is variable and relative; the spatial interrelations within the plurality of pure solids are purely intelligible, nonsensible, having the character of πλῆθος, or a discontinuous, discrete size, which is invariable and absolute (cf. above, nn. 215 and 217). 'Of quantity, one is discrete and the other continuous: one made up of such constituent parts as have a place in relation to each other, the other again—of such parts as have no place' (τοῦ δὲ ποσοῦ τὸ μέν ἐστι διωρισμένον, τὸ δὲ συνεχές, καὶ τὸ μὲν ἐκ θέσιν ἐχόντων πρὸς ἄλληλα τῶν ἐν αὑτοῖς μορίων συνέστηκε, τὸ δὲ οὐκ ἐξ ἐχόντων θέσιν, *Cat.* 6, 4b20–22; 5a15–16; 5a36–37; cf. *GC* I 6, 323a1–3; whereby each 'constituent part' (τὸ ἐνυπάρχον) of ποσόν is a self-subsisting individual thing (ἕν τι καὶ τόδε τι, *Met.* V 13, 1020a7–8). As for the spatial interrelations sans θέσις, these are, incidentally, best understood as τάξις, 'order', 'array', or 'arrangement' (τάξιν ἄν τινα ἔχοι, θέσιν δὲ οὐ πάνυ λάβοις ἄν, *Cat.* 6, 5a32–33; the distinction between θέσις and τάξις is perhaps ultimately drawn from atomistic technical jargon, *Met.* I 4, 985b14–15; VIII 2, 1042b14–15). On the other hand, only things that are characterised by μέγεθος and θέσις are capable of reducing their mutual distance up to the minimum size—that commonly known as 'contact' (ταῦτα ἂν ἅπτοιτο ἀλλήλων ὅσα διωρισμένα μεγέθη καὶ θέσιν ἔχοντα ἅμα ἔχει τὰ ἔσχατα, *GC* I 6, 323a4–6). So if it is common to speak of a spatial distance between, say, two bronze spheres (each occupying its own place in space), then this spatial distance will relate exclusively to the sensible matter the spheres are made of (that is, to bronze as the sensible matter of the bronze spheres), and not to the spheres as such (that is, to the bronze spheres *qua* spheres and not *qua* bronze); for among the latter—the pure pre-sensible spheres viewed *in abstracto* (ὑλικῶς)—there is neither spatial distance nor locomotion—but only 'order', 'array', or 'arrangement'. What moves, recedes or comes closer—what changes its place in space—are only the bronze objects of spherical shape, and not the pure intelligible spheres indwelling within them (which are themselves perfectly nonplaced, immobile, and therefore timeless as well). Although set in space, i.e. spatially exteriorised, individuated and multiplied, these pure intelligible spheres, taken in and of themselves, are neither localised in space nor locomobile therewithin (being consequently exempt from all temporality too: ἀΐδια καὶ ἀκίνητα ... πόλλ' ἄττα ὅμοια, *Met.* I 6, 987b16–17). Although spatially differentiated from each other, they are still not spatially distanced from each other. For spatial distance is what is only introduced by local matter. The property of spatial distance is what is lacking in physical space which has hitherto only been constituted at the level of pure intelligible matter. Pure pre-sensible physical space is placeless, and therefore distanceless, and, certainly, locomotionless (in fact, first and foremost locomotionless, and therefore distanceless, and *ultimately* placeless). It is thus 'Eleatic' in all respects—except for being inhabited by the unlimited multitude of Eleatic Ones; for that is what makes it distinctly Aristotelian.

Now if it is intelligible matter that allows the pure spatialisation of εἶδος, viz. the establishment of an infinite multitude of pure pre-sensible solids of the same type ('stereotypes') with their inherent impregnability and mutual collideability (see above, n. 210); then it is local matter that allows this rigid honeycomb arrangement of innumerable 'watertight compartments'—an orderly arrayed whole of the pre-sensible 'compartmentation' of a purely spatialised εἶδος—to finally be localised (placed) in space and start freely locomoting (or being continually displaced) within it. So, if it is by virtue of local matter that things are allowed to continually shift towards each other by reducing their mutual distance *ad infinitum*; then it is by virtue of intelli-

the solid, viz. plurality of solids—thus creating a necessary condition for mutual contacts between individual solids, which are now already sensible solids, or bodies, bodily enmattered substances;[241]

3) *Matter for alteration* allows change in quality as a consequence of mutual contacts between individual bodies—thus creating a necessary condition for change in terms of integration and separation;
4) *Matter for growth and diminution* allows change in quantity as a consequence of change in quality (alteration) of a substance intended to be integrated into, or separated from, the other one—thus creating a necessary condition for ceasing to exist and coming into existence;
5) *Matter for generation and corruption* allows a part of a diminuting substance to separate and to acquire its own substantial identity—

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gible matter that the self-same things (being ultimately impregnable, *that is = solid*) are nevertheless allowed to finally collide with each other, and thus *to finally complete their infinite approximation*. The odd circumstance that things progress towards each other at a Zenonian, mise-en-abymic pace of endless approaching only to paradoxically collide *at the end of this same endless approaching* is the normal result of a compromise—a synergetic marriage of the sensible and intelligible layers of the substance (virtual inseparability of μέγεθος and πλῆθος in one and the same thing). Thus the two bronze spheres *qua* spheres made of bronze (that is, *qua* pair of sensible bodies) always endlessly approach each other without ever colliding; whereas these same two bronze spheres *qua* spheres made of intelligible matter (that is, *qua* pair of nonsensible solids) always inevitably collide at the end of their endless approaching. The ultimate reason for their impregnability and mutual collideability is the very law of identity which prevents individual solids from interfering in the spatial domains of the adjacent solids of the same 'compartmentation' (see above, nn. 200, 203 and 210). For the spatial domains are not the same as the places in space. While the latter are sensible portions of three-dimensional space, themselves subject to permanent violation, encroachment, 'leaking' and redefining; the former are pure intelligible, pre-sensible portions of the very same three-dimensional space—which in turn are absolutely inviolable, not encroachable, 'watertight' and defined once and for all, that is, for life (cf. above, n. 210 ad fin.).

241 Locomotor mobility is, in principle, circular (*Met.* X 1, 1052a27–28; XII 7, 1072b8–9) to the practical exclusion of interference between the orbits: these are perfectly concentric and accordingly spared any contact or 'friction', even as the rings of an armillary sphere (which is evidenced by the reciprocal relationships of the naked-eye planets and their orbits, none of which intersects or collides, being out of the reach of quantitative, qualitative or substantial change). However, this tidy revolving motion will be ultimately marred by the further inclusion of lower material tiers (thus matter for quality enables, among other things, the appearance of weight/lightness, viz. gravity, and with it rectilinear, 'top-down/bottom-up' motion, which dramatically interferes with the original circular motility of pure solids, see e.g. *Cael.* I 4 270b33–271a3). Cf. *Phys.* VIII 10, 267b3–17. See above, n. 211.

> to come into existence; on the other hand, it also allows an existing substance, after having been integrated into another one and thus contributed to its growth, to lose its own substantial identity—to cease to exist. Thus generation turns out to be the immediate logico-ontological consequence of diminution, and corruption again the immediate logico-ontological consequence of growth—thereby confirming the immediate logico-ontological link between matter for growth and diminution (and consequently all other matters, sensible as well as intelligible) and matter for generation and corruption.[242]

Certainly, nature never flips through the pages of her own anatomy book, nor does she probe the logico-ontological stratigraphy of her own creations the way we have done, engaging in a step-by-step analysis that has otherwise only a pure theoretical character, not reflecting the natural order of generation. For under natural conditions, indeed, all material tiers go hand in hand, unlaminated, mutually coalescing, welded together and temporally indistinguishable, despite the incontestable logico-ontological priority of intelligible matter as a necessary transcendental precursor to the constitution of all the sensible remainder of the substance, and consequently also of matter for coming into existence and ceasing to exist.[243] Still, seen from an empirical point of view, intelligible and other matters all normally act in concert:[244] things leave non-spatiality and pass into space *at the same time* as they are being born,[245] the transcendental *con-*

242 Aristotle does not expressly draw this ultimate conclusion anywhere, even if it seems completely consistent with the overall tenor of his ontology and, in particular, with his conception of substantial strata in their entire mutual permeation.

243 The truth is, however, that the logico-ontological priority does not coincide with the temporal, so what marks the temporal inception (empirical birth) occupies in fact the extreme end of the logico-ontological process (transcendental conception/gestation of the mathematical solid). See below, nn. 245 and 284.

244 '[I]t [= intelligible matter] never exists without "sensible matter", i.e. without, at least, local matter' (Ross 1923, 167). The latter case would certainly concern supralunar beings—and perhaps also the pure ψυχὴ νοητική (ἀνάλογον οὖσα τῷ τῶν ἄστρων στοιχείῳ, *GA* II 3, 736b37–737a1) taken in its otherworld isolation (see above, n. 239). Be that as it may, any other sensibility of the heavenly spheres, as well as that of the pure intelligible souls of the departed, would have to be reduced to the mere presence of *inseparable universal accidents*, pure intelligible qualities made out of aether, otherwise completely inaccessible to the senses (thus the supralunar sun would normally involve a kind of universal, ethereal heat which is in itself perfectly temperatureless; and the beard of Tiresias' shade—a kind of universal, ethereal greyness which is in itself perfectly colourless); see above, nn. 108 and 220.

245 Since time is constituted with movement, movement again with local matter, and local matter with the birth of substance (except in the case of celestial bodies, *Met.* VIII 4,

ception (the constitution of the pre-sensible solid) and the empirical *birth* (the constitution of the sensible body) always coincide in actual reality.[246] This consequently applies to corruption/death as well: *contemporaneously* with the decomposition of the sensible body a pre-sensible solid 'degenerates' into a spatial point (στιγμή), and this again into a non-spatial unit (μονάς), a secondary substance, logical 'memory', μνήμη.[247]

1044b7–8; IX 8, 1050b20–21), it is more correct, strictly speaking, to say that time is born in substance than that substance is born in time. So it may be more accurate to say that the substance comes to life at the same time as its own lifetime's coming to life, and leaves life at the same time as its own lifetime's leaving of life. See below, n. 284.

246 'It is therefore preferable to take it so that [sensible] matter is inseparable in all [sc. particular individuals], being identical and numerically—*yet not logically—one* [= with intelligible matter]. Neither should we, for the same reason, assume that points or lines are matter of the [sensible] body. Matter is what they are the extremes of, and it can never exist without [sensible] qualification and without shape' (βέλτιον τοίνυν ποιεῖν πᾶσιν ἀχώριστον τὴν ὕλην ὡς οὖσαν τὴν αὐτὴν καὶ μίαν τῷ ἀριθμῷ, τῷ λόγῳ δὲ μὴ μίαν. ἀλλὰ μὴν οὐδὲ στιγμὰς θετέον οὐδὲ γραμμὰς τὴν τοῦ σώματος ὕλην διὰ τὰς αὐτὰς αἰτίας. ἐκεῖνο δὲ οὗ ταῦτα ἔσχατα ἡ ὕλη, ἣν οὐδέποτ' ἄνευ πάθους οἷόν τε εἶναι οὐδ' ἄνευ μορφῆς, *GC* I 5, 320b12–17). Although intelligible matter is never numerically separated from sensible matter; the unchangeable logico-ontological identity, the definition (λόγος) of an individual thing, does not rest on the sensible, but on the layer of pre-sensible, pure intelligible substance. For intelligible matter is matter of definition, logical *as well as ontological*, viz. *spatial* (= matter for both logical specification and spatial individuation). Intelligible matter defines the concrete identity of each individual three-dimensional solid as such—as the spatial εἶδος/μορφή (shape) of a particular individual. Anything less than a solid—that is, points and lines (and planes)—are just 'extremes', the boundaries of a body, both sensible and pre-sensible: for εἶδος/μορφή of a solid body (together with its boundaries) is numerically one, at the same time sensible and pre-sensible indifferently. It is certainly true that two substances cannot occupy the same space at the same time, but two different material layers of a substance can, nay must (see above, nn. 200 and 210). The actual spatial separation of the material layers would otherwise lead to the actual decomposition of a substantial identity: for life is the consequence of the actual *spatial coincidence* of soul and body, death again the result of their actual *spatial separation* (whereas the soul, the εἶδος of the body, receives its concrete physical spatiality only insofar as it is supported by intelligible matter, as matter for spatial extension).

247 Not infrequently also ethical, filled with emotional connotations of memory in a more familiar sense (such as those enshrined in the phrase 'of blessed memory').

On the metaphysical incorruptibility of geometricals, cf. *Met.* III 5, 1002a32–34.

8. Flesh & Plush: The Ontology of the Toy

Our analysis so far allows us to see in a somewhat altered light the ontological specificity of the toy, the first and foremost topic of our discussion, from which we have long been separated. The toy is definitely one of those things that do not come into the world via any of the usual forms of generation. Non-natural as it is, toy generation cannot be deemed artificial in the ordinary sense either. The ontological status of the toy proves therefore quite exceptional: unlike 'a man or a plant or something else amongst such things that we say are substances to the greatest extent',[248] the toy—although constituting a fairly specific kind of artifact the shape of which most often coincides precisely with the shape of a man, animal, plant or the like—turns out to be a substance to a rather conditional degree. So let us first recall some of the salient points of our analysis hitherto, taking into account in particular Aristotle's own typology of modes of generation as our main point of reference.[249] This will allow us to specify more precisely toy generation itself, assigning it the most appropriate place possible among the other types of generation.

8.1.1 As is known, the philosopher distinguishes three types of generation: natural, artificial and spontaneous; the third of which, owing to

248 ἄνθρωπος ἢ φυτὸν ἢ ἄλλο τι τῶν τοιούτων, ἃ δὴ μάλιστα λέγομεν οὐσίας εἶναι, *Met.* VII 7, 1032a18–19; cf. *De An.* II 1, 412a11–13.

249 *Met.* VII 7; VII 9; XII 3, 2.

its somewhat controversial nature, has no relevance for our present consideration.[250]

So let us now overview the most important coincidences and divergences between the natural and artificial types of generation. This time too, it is worth emphasising once again the original feature of the Stagirite's ontology that can hardly be overstated: *the essential indivisibility of its logical and biological facets*. The Aristotelian ontology rests on a conception of one unique and essentially indivisible logico-biological development. This should also be borne in mind when comparing the natural and artificial forms of generation, since neither actually has ontological primacy over the other. For neither is natural, biological generation more essential than artificial (the latter being based, by assumption, on certain prior logical reasoning,[251] or 'form in the soul');[252] nor, conversely, is artificial generation, perhaps, a sort of a logical prototype or model of the natural type. According to Aristotle, the two types of generation are *au fond* tantamount to each other (regardless of whether the naturally generated substance retains the privileged status of the μάλιστα οὐσία).

Seen in terms of the four causes of generation, this would look as follows:[253]

1) *Causa materialis*—actually intelligible matter[254]—is the cause for which the role of the generic principle is most specifically reserved: as such, the material cause represents the genus in potentia, latently contained in as yet unformed, spatially undefined objects of both natural and artificial provenance alike. Thus the genus horse is potentially contained in an unfertilised mare's egg in essentially the same manner as the genus house is potentially contained in

250 *Met.* VII 7, 1032a31; VII 9, 1034b4–6. Some animals are born from putrid matter and faeces, like insects (*HA* V 1, 539a23–25); from mud and sand, like some fish (V 11, 543b17–18; VI 15, 569a10–11); from mud and putrid matter, like some testaceans (V 15, 546b23–24); in rocky caves, like sea-nettles and the sponges (V 16, 548a22–24).

251 In the *Nicomachean Ethics*, artificial generation (ποίησις) is defined as 'a certain capacity to create on the ground of (previous) reasoning' (ἕξις τις μετὰ λόγου ποιητική, see *EN* VI 4, 1140a1 ff.). See above, n. 20.

252 τὸ εἶδος ἐν τῇ ψυχῇ, *Met.* VII 7, 1032b1; ὁ ἐν τῇ ψυχῇ λόγος καὶ ἡ ἐπιστήμη, VII 7, 1032b5–6 (the wording 'ἡ ἐπιστήμη' is that of A^b).

253 For four causes, see the standard overview in *Met.* V 2, 1013a24 ff. (= *Phys.* II 3, 194b23 ff.). Cf. also *Met.* I 3, 983a27–32; VIII 4, 1044a34–b1; *Phys.* II 7.

254 See below, n. 258.

a disintegrated heap of bricks and wood,[255] or a genus herm in a piece of unworked marble.[256]

2) *Causa formalis* is responsible for the role of logico-ontological differentia specifica functioning as a proper fertilising agent in the generation process. By coming into fertilising contact with the genus horse potentially contained in an unfertilised mare's egg, the differentia specifica inherent in the semen of the male causes the horse in general, the equinity residing in the mare's egg, to exit into space in the form of an individuated (= spatially extended) species, first in terms of a spatial point (residing in the zygote of the mare), then eventually (as a result of a geometrico-biological self-constitution within the spatial framework of a mare's zygote) as a three-dimensional solid (geometrico-biological sphere, morula). As the natural causa formalis normally abides in the semen of the male, its artificial equivalent indwells the mind of the ποιητής (being his εἶδος ἐν τῇ ψυχῇ).[257] In the fertilising touch

255 '[T]hose who, speaking of *what* a house is, say that it is stones, bricks and wood, speak of the house in potentia: for these things are its matter' (οἱ μὲν λέγοντες τί ἐστιν οἰκία, ὅτι λίθοι πλίνθοι ξύλα, τὴν δυνάμει οἰκίαν λέγουσιν· ὕλη γὰρ ταῦτα, *Met.* VIII 2, 1043a14–16).

256 Species with wider extension also belong to the same genus (cf. *An. Post.* II 13, 96a24–27). An unfertilised mare's egg designated with the genus horse, potentially contains not only members of the species horse (various horse breeds), but also specific members of the genus horse that can also be generated from a mare's egg (like the mule and the so-called 'zorse', produced by crossing the horse mare and the donkey, resp. zebra stallion, whereby offspring is generated which is only a horse in the generic and not in the specific sense, cf. *Met.* VII 8, 1033b34–1034a2). Likewise, a heap of bricks and wood designated with the genus house, potentially contains not only members of the species house (various types of residential building) but also specific members of the genus house that can also be generated from this heap of bricks and wood (like inn, theatre, brothel or animal house). Finally, a piece of marble designated with the genus herm, potentially contains not only members of the species herm (various specific types of Hermes proper carved in the shape of a bust on a square pillar), but also specific members of the genus herm that can be generated from this piece of marble (like all manner of single and double sided hermaic busts depicting other gods or historical figures).

257 '[F]or instance, a house is generated from a house, inasmuch as it is generated by reason [νοῦς]: for the art is εἶδος' (οἷον ἡ οἰκία ἐξ οἰκίας [sc. γίγνεται], ᾗ ὑπὸ νοῦ· ἡ γὰρ τέχνη τὸ εἶδος, *Met.* VII 9, 1034a23–24, ᾗ instead of ἤ, as argued by Jaeger, Ross, Frede et al.; ἐξ 'from' refers to the material cause, a namesake 'part' of the future house [= bricks and wood destined to become a house, see above, n. 101]; while ὑπό 'by' refers to the formal cause, an εἶδος ἐν τῇ ψυχῇ, cf. e.g. *Met.* VII 7, 1032a14). There is an intimate affinity between the εἶδος in the soul and the εἶδος in the sperm: 'For the sperm produces in the same way that the artifacts are produced: it contains

between causa formalis (differentia specifica) and causa materialis (genus proximum), a heap of bricks and wood that until now was only a heap of bricks and wood takes on the character of a concrete, spatially defined house in potentia (stereometrically projected into a concrete physical space intended for future construction, yet so far completely devoid of any of the sensible properties of a particular house); while a piece of marble which until now was only a piece of marble assumes the character of a concrete, spatially defined Hermes in potentia (stereometrically projected into the concrete physical space of a marble block, yet so far completely devoid of any of the sensible properties of a particular herm). In this way, both the house and the sculpture of Hermes become concretely, spatially *conceived*. This conception signifies their first entry into a concrete physical space (originally in the form of a spatial point, then ultimately of a three-dimensional solid). It entails the insertion of a full-scale stereometry shape, a life-size projection of a house or sculpture into a concrete section of physical space, although so far without the participation of any of the sensible properties of the given physical object (since the house or sculpture has hitherto been realised only in purely intelligible matter, without involving any sensible materiality originating from the lower tiers, and hence perfectly impalpable, imponderable, asomatous and 'spectral', despite all its concrete physical thisness and hereness, its ability of being shown with the finger or even fully circumambulated).[258]

3) *Causa efficiens* works as an appropriate vehicle for causa formalis: thus the natural causa efficiens, the sperm of the stallion, transmits the inherent εἶδος, the biological differentia specifica, to the unfertilised mare's egg, the natural container of the still unspecified bio-

εἶδος in potentia' (τὸ μὲν γὰρ σπέρμα ποιεῖ ὥσπερ τὰ ἀπὸ τέχνης· ἔχει γὰρ δυνάμει τὸ εἶδος, *Met.* VII 9, 1034a34–b1).

258 Causa materialis being partitioned into several layers, it should be emphasised once again that in the current process of prespatio-spatial definition of substance—at the stage of its a) logical specification, and its b) ontological individuation—only the highest material layer, intelligible matter, participates. It means that the fertilising causa formalis comes into contact solely with this, intelligible layer of substance, which is the first, outermost and most exposed, without affecting in the least the other, sensible tiers, which are subordinate and lie beyond the ambit of the formal cause: the conception thus takes place solely in contact between the formal cause (differentia specifica) and the intelligible matter (ovulated εἶδος, infima species), so the other layers of matter have no involvement whatsoever in conception as such.

logical genus horse;[259] while the artificial causa efficiens, ποιητής, conveys the εἶδος residing ἐν τῇ ψυχῇ, the logical differentia specifica, to a heap of bricks and wood, or to a piece of marble, the artificial genus of a house or a herm respectively.

4) *Causa finalis* sets an absolute, canonical measure of the substance in the form of a spatially defined εἶδος—transcendental schema inscribed in a three-dimensional space, a concrete portion of thisness and hereness allotted to a single individual of the species and available for lifetime use. The fertilised mare's egg sets thereby the spatial 'negative' of the horse in and of itself (αὐτόϊππον) establishing an absolute measure of the spatial extension of each possible individual of the equine species. Being standard, it applies to all individual cases alike. This natural conception in the spatial sphere of the fertilised egg has, then, its counterpart in the artificial conception in the spatial sphere of the projected house, in the concrete life-size portion of space destined to be filled with sensible bricks and wood and qualified by all the accidental and substantial features of a generated house, also including its natural propensity for dilapidation and final corruption. This preliminary setting of τέλος, thus, precedes generation, and constitutes the basic content of the conception phase in the creation of substance. The conceived εἶδος and the generated εἶδος accordingly dovetail into each other the same way as a transcendental 'mould' (absence, privation[260] of sensible properties) and empirical 'cast' (presence, possession[261] of sensible properties), sharing not only a unique shape but also a common and numerically unique fraction of the concrete physical space they each occupy simultaneously in their own way (whether surrounding it or being surrounded by it).[262] The only difference lies in the fact that this hitherto only

259 For menstrual blood as a material principle functionally equivalent to the female egg, see above, n. 100.

260 στέρησις

261 ἕξις

262 Much like the shape of 'Pauson's Hermes' (*Met.* IX 8, 1050a20), a hyperrealistic marble with a perfectly polished surface, of which (due to its complete 'adhesion' to the shape of the god) it was impossible to say whether it was the inner or outer surface of Hermes himself: either the one resting against the surface of the marble on the outside, or the one enclosed in transparent marble, i.e. pressed against its surface on the inside; in other words: whether the shape was that of a 'mould', of Hermes in potentia, or that of a 'cast', of Hermes in actu (the interpretation comes from Alexander of Aphrodisias, *In Metaph.* 588.19–589.6 Hayduck; yet Ross II 1924, 263, disputes it,

> conceived shape, being a purely schematic, transcendental entity, consists of intelligible matter alone, consequently lacking any trace of sensibility. Until the point of generation, this shape appears as purely negative; while from that moment on, it begins to fill with the gradual layers of a sensible content, moulding an individual, changeable and corruptible copy of an εἶδος: a 'this here' horse, a 'this here' house, a 'this here' herm, occupying the same portion of physical space that was previously demarcated by a hollow ('concave') volumetric shape ('wireframe model') of a pure intelligible solid.

8.1.2 It is not inappropriate at this point to clearly delineate the particular competences of causa formalis and causa finalis, as their tasks are closely linked and complementary, and therefore easily confounded. The formal cause defines the elementary 'pointlike' haecceity of a thing, as well as the entire initial stage of constituting the spatially extended εἶδος, the 'gestational' stage starting with the spatial point and ending with the ultimate constitution of the three-dimensional solid. The final cause, on the other hand, *consolidates the solid* preparing it for the subsequent reception of the intended sensible infill. The two causes thus refer to two functionally distinguished *stages* of the unique and continuous atemporal process of pre-sensible constitution-cum-consolidation of the spatially extended εἶδος.

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which seems unnecessary). Cf. *Met.* V 17, 1022a4–5 (πέρας as ἔσχατον of both the ἔξω and the ἔσω at the same time).

Differentia specifica is essentially the negative, the mould, *the shape of absence* of a species intended to be differentiated within a genus, that is to say, cast in positive form, assuming *the shape of presence*. Consequently, the interior form inherent in the differentia specifica and the exterior form inherent in the differentiated species are εἴδει one and the same in the same way as the inner shape of the hollow cavity of a mould and the outer shape of the solid swelling of a cast are εἴδει one and the same (despite the numerical distinctness between mould and cast, cf. *De An.* II 12, 424a19–21). Causa formalis—differentia specifica—is therefore to be likened to a signet ring containing what can be called *negative information* (form in *negative mode*); while causa materialis—genus proximum—would correspond to a piece of sealing wax containing the potentiality for the information it receives from the signet ring, transforming it from negative into *positive information* (form in *positive mode*). As a genus proximum, sealing wax contains the potentiality for more than one piece of information of the same class, each inherent in this or that signet ring, as the bearer of this or that differentia specifica within the same genus: so the genus proximum horse not only contains the potentiality for being informed by the differentia specifica defining the species horse, but also by the differentiae specificae defining the species mule or 'zorse', see above, n. 256.

8.2.1 Here it is that a clear-cut distinction should also be drawn between *privation* and *potentiality*. Privation falls within the exclusive competence of intelligible matter (*qua* causa finalis). By installing the pure spatial εἶδος, intelligible matter establishes an absolute, *standard measure of privation*, which in itself is nothing other than *a pure lack of sensibility* (generability included).[263] Sensibility, for its part, falls within the competence of sensible layers of matter, on which intelligible matter does not depend. Again, the basic property of sensible matters is potentiality, a possibility of sensible things both to be and not to be.[264] It goes without saying that a things' possibility both of being and of not being only makes sense in regard to privation as such: for being, or the presence of sensibility (= realised potentiality), amounts to nothing but a partial or total *abolition of privation* (and subsequent establishment of ὁμαλότης, 'evenness', or equipoise between pure privation and its sensible 'filling');[265] whereas not being, as the absence of sensibility (= unrealised potentiality) leaves privation itself more or less intact in its inherent vacancy. Without privation as the criterion measure of its own actualisation, potentiality simply could not have had the character of the possibility both of being and of not being: it would simply not have been known if and to what extent potentiality had been realised. A heap of bricks and wood not qualified by privation (= not coordinated with a portion of space intended to be occupied by the future building)[266] is *ipso facto* stripped of any prospect

263 Not being is inherent in the very notion of privation as such. While matter is—or, rather, has—the possibility of not being (as one of the two existential alternatives), such nonexistence has only an accidental character (matter can also exist). On the contrary, privation is intrinsically and non-alternatively non-existent—it is not-being itself, the very vacancy of being (therein lies the difference between vacant matter and vacancy of matter): 'For we say that matter and privation are two different things, and that one of them, matter, is not-being only accidentally, while privation is not-being in and of itself; and that the former, matter [sc. even if it does not yet exist in actu], is close to substance, and *is* in a sense a substance, while the latter is in no sense a substance' (ἡμεῖς μὲν γὰρ ὕλην καὶ στέρησιν ἕτερόν φαμεν εἶναι, καὶ τούτων τὸ μὲν οὐκ ὂν εἶναι κατὰ συμβεβηκός, τὴν ὕλην, τὴν δὲ στέρησιν καθ' αὑτήν, καὶ τὴν μὲν ἐγγὺς καὶ οὐσίαν πως, τὴν ὕλην, τὴν δὲ οὐδαμῶς, *Phys.* I 9, 192a3–6).

264 *Met.* VII 7, 1032a20–22; cf. IX 8, 1050b11–12. Potentiality, as an equal possibility of being and not-being, extends to all categories: substance, as well as quantity, quality and place, *Met.* VII 7, 1032a14–15 (i.e. to both 'unqualified' and 'qualified' coming into being and passing away, *Phys.* V 1, 225a12–20.

265 *Met.* VII 7, 1032b7–8.

266 Being physical and concrete by nature, privation is always found *in situ*, 'on the spot', characterised by the most faithful 'life size' of the privated (= intended) thing. The physical space of the privation and the physical space of the privated thing are always numerically one and the same. Privation and the privated thing always share one and the same 'on-the-spot-ness' of the concrete physical portion of space. See above, n. 210.

of being potentially a house: since it was never even meant to be a house, it is similarly never confronted with the alternative of being or not being a house—such an issue was never on the agenda, as it were. So it is simply left without the possibility of making a choice: being a sheer unqualified heap of bricks and wood, it is *ipso facto* already limited to a single and no alternative option, namely, that of definitively and positively not being a house.[267] Privational unqualifiedness implies depotentialisation.[268]

267 Likewise, only the fertilised mare's egg can be the privation of the future horse, the horse in potentia, the one that can both be and not be (as the conception may either succeed or fail). The unfertilised mare's egg, on the other hand, has no other choice but not to be a horse (for the horse is not even conceived). In the absence of an alternative as to whether or not to be a horse, the unfertilised egg consequently fails to be the privation of the future horse, the horse in potentia. For the essence of potentiality consists precisely in the existence of an alternative possibility both of being and of not being (see above, n. 264), whereas the reduction to a single, no alternative possibility (that of not being) amounts to undoing the very essence of potentiality. At any rate, one must not confuse *potentiality* (δύναμις) and *possibility* (ἐνδεχόμενον, ἐνδέχεσθαι): while potentiality as such has two alternative possibilities (being and not being), either possibility is in itself a non-alternative (being is being, not being is not being). '[E]very potentiality is at the same time a potentiality for the opposite [...] So, that which has the potential to be has the possibility both of being and of not being' (πᾶσα δύναμις ἅμα τῆς ἀντιφάσεώς ἐστιν ... τὸ ἄρα δυνατὸν εἶναι ἐνδέχεται καὶ εἶναι καὶ μὴ εἶναι, *Met.* IX 8, 1050b8–12).

268 If intelligible matter at the ultimate point of logical maturation and ovulation of εἶδος lets the causa efficiens slip away, it thereupon gets depotentialised, viz. *deprived of the possibility of being or not being fertilised* (see the previous note). Now as a consequence of depotentialisation, the unfertilised egg gets discarded along with menstrual flow; while the unfertilised heap of bricks and wood (= one that ultimately failed to fruitfully associate with the concrete volumetric conception of the house within a this here portion of space) sooner or later decomposes and rots, sinking down into the 'melting pot' of first matter (and ensuing 'anonymousness'). A unique, one-time possibility of being fertilised or not fertilised is not perennial—not perennially offered: it can only be exploited or missed within a certain time frame ('fertile window'). Therefore it seems that it would be more correct to speak of *two potencies*: the first and the second (yet not quite along the lines of the distinction set out at *De An.* II 5, 417a21–b2). Thus the first potency would relate to the possibility that precedes the pending fertilisation—the alternative possibility of the ovulation achieved to lead or not to lead to *conception* ('ovulated egg potency'); whereas the second potency would properly concern the possibility that follows the accomplished fertilisation—which is indeed a quite distinct possibility, namely the one of the completed conception to lead or not to lead to *generation* ('fertilised egg potency'). For conception too is just one kind (or, rather, stage) of potentiality: the open possibility of the ultimate actualisation of a substance through generation and subsequent development on all the remaining levels of sensible matter. Conception is therefore not the same as generation, which latter essentially depends on the presence of sensibility—whereas sensibility is normally absent at the stage of pure conception (which by definition is exactly the pure privation of sensibility). That is why

8.2.2 The concrete and physical nature of privation[269] implies yet another important distinction: that between *cogitation* and *conception*. In the latter, namely, it is not difficult to recognise privation itself—for privation is really just another name for conception.

Aristotle himself defines cogitation (νόησις) as the first phase of the generation of an artificial thing: 'The process extending from the beginning and the εἶδος is cogitation, whereas that from the final part of the cogitation is production' (ἡ μὲν ἀπὸ τῆς ἀρχῆς καὶ τοῦ εἴδους νόησις, ἡ δ' ἀπὸ τοῦ τελευταίου τῆς νοήσεως ποίησις).[270] It is easy to observe that Aristotle's cogitation phase—the stage of internal self-defining, self-distinguishing and self-clarifying of the concept—coincides entirely with what our previous analysis called a logical, pre-spatial stage of division, the one falling within the exclusive competence of intelligible matter *qua* generic element in a definition.[271] The cogitative section of the generation process, which, according to Aristotle, extends 'from the beginning and the εἶδος', would accordingly correspond to the whole interim between the genus remotissimum (= ἀρχή)[272] and the infima species (= εἶδος).[273]

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conception (as *the already exploited, closed possibility of fertilisation*) can be correctly labelled a second potency (as *still unexploited, open possibility of generation*); unlike ovulation, for which, again, the label of first potency (as *a still unexploited, open possibility of fertilisation*) seems quite well suited. Thus it might be well that a substance be realised at the level of the first potency (being conceived), and yet remain ultimately unrealised at the level of the second one (not being generated), see above, n. 164. On failed conception, see below, n. 285.

The existence of the pair of potencies is easily explained by the very two-sided Janus-like nature of intelligible matter, which *on the one side* establishes the alternative possibility (= potency) of conception ('ovulated egg potency', or first potency—one preceding conception), and *on the other side* the alternative possibility (= potency) of generation ('fertilised egg potency', or second potency—one following conception).

269 Privation can only take place in a context of spatial exteriorisation. There is no room for privation in the abstract ambience of pure pre-spatial cogitation. As long as cogitation is closed in itself, being outside the relation to concrete physical space, the necessary condition to constitute privation is missing, for privation is actually nothing but *concrete lack of spatial sensibility*.

270 *Met.* VII 7, 1032b16–17; cf. also *EN* III 5, 1112b23–24 (ἡ δὲ βούλευσις πᾶσα ζήτησις, καὶ τὸ ἔσχατον ἐν τῇ ἀναλύσει πρῶτον εἶναι ἐν τῇ γενέσει); *EE* II 11, 1227b32–33 (τῆς μὲν οὖν νοήσεως ἀρχὴ τὸ τέλος, τῆς δὲ πράξεως ἡ τῆς νοήσεως τελευτή).

271 ὕλη νοητή of *Met.* VIII 6, 1045a33–35.

272 That is, a category. 'I call the ἀρχαί in each genus those whose existence cannot be demonstrated' (λέγω δ' ἀρχὰς ἐν ἑκάστῳ γένει ταύτας, ἃς ὅτι ἔστι μὴ ἐνδέχεται δεῖξαι, *An. Post.* I 10, 76a31–32). Cf. *Met.* III 3, 998b28; XI 1, 1059b38–1060a1.

273 In spite of the somewhat ambiguous wording—ἀπὸ τῆς ἀρχῆς καὶ τοῦ εἴδους—εἶδος would certainly not be located at (or 'next to') the beginning, but at the very opposite

The last one would constitute the natural outcome of the cogitative, logical stage of division, its critical stoppage being conditioned by the limitation inherent in the nature of the lowest species as such. The crisis, as we have seen, stemmed from the simple internal exhaustion of logical division, the constitutional inability of infima species to maintain the momentum of autogenetic proliferation of differentiae.[274] The obstacle was only overcome by the introduction of a foreign auxiliary, a heterogeneous differentia coming from the outside in the capacity of a causa efficiens: either a) in the form of a practical, volitional act of spatial externalisation coupling with the potential εἶδος in the soul;[275] or b) in the form of animal sperm, a biological externaliser coupling with the potential εἶδος in the

end of the cognition process—in polar opposition with its more or less vague and cloudy ἀρχή, that is, a category (see the previous note); from whence it follows that it can only be the lowest and the most determined of species.

274 *Met.* VII 12, 1038a25–26; *An. Post.* II 13, 97a18–19.

275 See *Met.* VII 7, 1032b1–2, 5–6: '[...] the εἶδος [is] in the soul; by εἶδος I mean the essence [τὸ τί ἦν εἶναι] of each thing [...] health is the λόγος and ἐπιστήμη in the soul', ... τὸ εἶδος ἐν τῇ ψυχῇ. εἶδος δὲ λέγω τὸ τί ἦν εἶναι ἑκάστου ... ἡ δὲ ὑγίεια ὁ ἐν τῇ ψυχῇ λόγος καὶ ἡ ἐπιστήμη (the wording 'ἡ ἐπιστήμη' is that of A^b). At this point, Aristotle reaches for his favourite instance of the doctor. The εἶδος of health is in the soul of the doctor: it is his professional knowledge, a 'science' (ἐπιστήμη), or a formula (λόγος) defining the essence (τὸ τί ἦν εἶναι) of health; which in its turn is the pure form of a concrete, sensibly enmattered health ('Under the substance without matter I mean an essence', λέγω δὲ οὐσίαν ἄνευ ὕλης τὸ τί ἦν εἶναι, *Met.* VII 7, 1032b14). Being a 'science' ('the medical art', ἡ ἰατρική, *Met.* VII 7, 1032b13), the pure εἶδος of health is in truth nothing but a thoroughly defined and clarified (clear and distinct) *concept* of health—the health's own infima species indwelling in the soul of an experienced physician. As such, this hitherto only conceptual health needs an efficient cause to be conveyed from the purely cogitative, pre-spatial and logical sphere, into the physical, spatial and ontological one. The role of causa efficiens thereby belongs to the practical, volitional act of spatial externalisation of the hitherto merely cogitative εἶδος of health; on which see the following note. (This action, however external in relation to the εἶδος of health, originates from the same personality of the doctor, though from another part of his soul: the deliberative one, the so-called προαίρεσις, 'purpose', the proper efficient cause of the ensuing action: προαίρεσις ὄρεξις βουλευτική, cf. *EN* VI 2, 1139a23, esp. 1139a31–34; see also III 5, 1113a2–12; cf. *Met.* V 5, 1015a32–33; VI 1, 1025b23–24.) Still this exteriorised, spatially individuated health—which is transported into physical actuality, yet in a characteristically *contrarian* manner—is in fact a pure *privation* of an actual sensible health. Being such, it encroaches on the current disease (assuming the name of 'correct diagnosis', *Met.* VII 7, 1032b6–9; 1032b18–21, see above, n. 200): so it imposes an absolute measure of health upon the existing disease, redefining it in terms of health ('cataphatically'), and therefore ultimately as vitiated, reduced or partial health, a 'poor' health in need of expert medical treatment (VII 7, 1033a11–12). Such treatment (= inducing body heat by rubbing, VII 7, 1032b26) turns out to be an ensuing *movement* (VII 7, 1032b10) of transforming a disease, previously redefined as an incomplete, privated and potential health, into a complete, non-privated and actuated health, one that has, as it were, attained and

ovulated egg. (By essentially equating the logico-volitional and biological aspects of the ontological definition[276]—the move of complete unification that Aristotle ultimately did not make[277]—the cogitation stage becomes an integral part not only of artificial but also of natural generation, which necessarily leads to the conclusion that the natural oogenesis comes to be a kind of *biological division* in which the final stage of egg maturation corresponds to the state of the ultimate derivedness and clarifiedness of the biological εἶδος within the animal egg—a kind of *logical ovulation*.)[278]

'levelled up' (VII 7, 1032b19) the full measure of its own privation, and thereby eliminated the very privation as such (cf. *Met.* VII 7, 1032b2–14; see above, n. 101).

276 'The definition of what, *as a result of thinking*, becomes something actual out of something potential, consists in that it becomes so *on the basis of will*, if no outside factor prevents it' (ὅρος δὲ τοῦ μὲν ἀπὸ διανοίας ἐντελεχείᾳ γιγνομένου ἐκ τοῦ δυνάμει ὄντος, ὅταν βουληθέντος γίγνηται μηθενὸς κωλύοντος τῶν ἐκτός, *Met.* IX 6, 1049a5–7). This definition of the ontological definition is, not unexpectedly, followed by the usual stock instances of a patient (intended to become healed), a building material (intended to become a house), and a human sperm (intended to become a man), all three listed together in an unbroken sequence, with the only caveat that the 'generative principle' of the latter is 'already contained in the thing itself' (IX 6, 1049a7–14). Yet this natural immanence of the generative principle (ἀρχὴ τῆς γενέσεως, i.e. εἶδος, causa formalis), which gives sperm its privative/potential character (that of a 'man to be'), is essentially conditioned by a prior fertilising contact with the female, material component (causa materialis) of the desiderated substance: only the sperm which has already 'undergone a change within another environment' (ἐν ἄλλῳ), and not the isolated sperm in and of itself, the yet unchanged sperm, can be considered a man in potentia (IX 6, 1049a14–17). For, strictly speaking, the sperm as such is not causa formalis but causa efficiens, the mere transmitter, i.e. the vessel and vehicle of causa formalis (which is itself, as it were, transported within the sperm—so very much in line with what is known from modern genetics). It is only after merging with the causa materialis (after fertilisation) that the sperm can become a man in potentia, that is: causa formalis ('already contained in the thing itself'). Thus the difference between the three apparently heteroclitic examples does not seem at all as profound as the philosopher himself presents it: for just as a) the doctor transfers the εἶδος of health onto the disease and thus redefines the disease into the privation of health—a health in potentia; and b) the builder transfers the εἶδος of the house onto the heap of bricks and thus redefines the heap of bricks into the privation of the house—a house in potentia; so too c) the sperm transfers the εἶδος of a man onto the egg and redefines the egg into the privation of a man—a man in potentia (so that it is only in this connection, viz. after fertilisation has already taken place, that the sperm eventually loses its original character of causa efficiens and—freed from the old cocoon, so to speak—assumes the role of a generative principle proper, a causa formalis 'already contained in the thing itself').

277 Although he often cites examples from both areas in the same connection (cf. e.g. the essential interchangeability of ποιεῖν and γεννᾶν in *Met.* VII 8, 1033b22–23).

278 Although giving artificial generation a distinct biological flair (typically permeating all parts of his system), Aristotle still does not venture to roundly reverse his equation

However, neither is the phase which begins from the end of cogitation—that which Aristotle calls production (ποίησις)—itself monolithic, as one

by giving biological generation in turn the full flair of artificial and artistic production—ποίησις. As a result, biological generation remains with him deprived of that essential part of all artificial/artistic creativity—a *cogitative prelude*, without which there can be no 'poetic' generation as such (as ἕξις τις μετὰ λόγου ποιητική, *EN* VI 4, 1140a1). Biological fecundation would consequently retain its 'nondeliberative', fortuitous and ultimately *non-poetic* character—the property of ἀτεχνία ('lack of art', *EN* VI 4, 1140a21–22; actually a sort of 'artificial spontaneity', to use an oxymoronic expression, *Met.* VII 7, 1032a28–30; 1032b23–25; for the 'nondeliberative' character of natural generation, see *Phys.* II 8, 199b26–29). Such inconsistency would not be amended for two millennia until William Harvey, who otherwise strictly follows the overall systemic guidelines of the Stagirite's ontology (in particular, its doctrine of the four causes, see above, n. 100). Harvey offers his reflections in a brief opuscule *De conceptione*, appended at the end of his *Exercitationes de generatione animalium*. Remaining generously open to the possibility that the further development of science may correct or even entirely invalidate his own speculations, Harvey, one of the forefathers of modern embryology, indulges in some otherwise fairly 'Aristotelesque' conjectures concerning the functional and anatomical similarities between the brain and the uterus—which latter he imagines in a pretty 'brain-like' fashion ('answering in *lubricity* and *softness* to the internal ventricles of the *Braine*')—a pair of essentially kindred organs engaged in the same task of a pure *noetic ideation* of a future conception. (By starting from the 'homonymy' of the term *conception*, Harvey clearly follows in the footsteps of the Aristotelian methodology, strongly anchored in the λέγεται πολλαχῶς starting principle of any serious conceptual analysis.) '[S]eeing the substance of the *Uterus*, now ready for *Conception*, doth so neerly resemble the Constitution of the Braine: why may we not imagine, that both their functions are also alike; and that something like, if not the selfe same thing that the *phantasme*, or *appetite* is to the *brain*, is excited in the *Uterus*: from which the generation or procreation of the *Egge* doth succeed? for both their functions are equally called *conceptions*, and both are *Immaterial*; [...] So also from the *Male* (as being the more *perfect Animal*) as from the most natural appetible object, the natural conception doth arise in the *Uterus*, as the Animal [= soul's intellectual] conception in the Brain. [...] For as we, from the Conception of the Form, or Idea, in the Braine, do fashion a form like to it in our works, so doth the Idea or Species of the Genitor, residing in the *Uterus*, by the help of the formative facultie, beget a *Foetus* like the Genitor himself; namely by implanting that *Immaterial species* which it hath, upon its Workmanship. In like manner as *Art*, which is the εἶδος, or Species of the future work, doth produce a Like in its operation, and generate it in the *matter*: As the Builder erects a House, according to his pre-received conception. And the same thing happeneth in other productions, and artificial generations. So that what discipline [= 'science', ἐπιστήμη] doth effect in the *Braine*, namely Art, that in proportion doth the Coition of the Male effect in the *Uterus*, namely the *plastical Art*: whereby several *foetuses* are procreated either like or unlike, by the same Coition. For if the Generations, and first artificial conceptions (which are onely imitations of the natural) are thus produced by the Braine; how much more probable is it, that the Exemplars of Animal Generation and conception, are in like manner produced by the *Uterus*' (quoted from the anonymous English rendition of 1653, Harvey 1653, 543–45; corresponding lines in the Latin original: Harvey 1651, 295–96; cf. also modern translations: Harvey 1847, 577–78; Harvey 1981, 445–46). Cf. Lennox 2006, 43–45; Davis 2019, 1323–25.

might *prima facie* infer from the words of the philosopher (ἡ δ᾽ ἀπὸ τοῦ τελευταίου τῆς νοήσεως ποίησις). It itself actually consists of two phases as well, to wit: a) *the phase of conception*, extending from the moment of going out into space and establishing a spatial point, until the moment of formation of a spatial solid, as a necessary condition for coming into the world and ultimate generation; and b) *the generative phase*, extending from generation to corruption, wherein all the remaining sensible layers of matter finally come into play (of course, mainly the generative layer), while individuation achieves its entelechy in a harmonious synergy of all substantial matters, both intelligible and sensible all at once. So the whole process would unfold not exactly in two but in three moves, namely:

a) *cogitation* (νόησις), from the genus remotissimum[279] to the infima species,[280] the pre-spatial point (μονάς);
b) *conception* (σύλληψις),[281] from the spatial point (στιγμή) to the solid, the pre-sensible body;[282] and lastly—

   yet firstly in terms of time—
c) *generation* (γένεσις), from the birth of the sensible body (= sensible incarnation of the solid) to its sensible death, the decomposition of a particular individual (τόδε τι).

Thus the last two phases, the phase of conception (which falls within the sole competence of intelligible matter *qua* principle of individuation) and the phase of generation (which comes under the jurisdiction of sensible matters, mainly matter for generation and corruption), constitute two distinct sub-phases of a single and virtually uninterrupted phase of *production* (ποίησις).[283]

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279 A category

280 ἀπὸ τῆς ἀρχῆς καὶ [= ἕως] τοῦ εἴδους

281 On biological σύλληψις: *HA* VII 2, 582b11–12; VII 3, 583a19; 583a31; VII 4, 584a2; 584b21; VII 4, 585a12; X 4, 636a37 (on failed σύλληψις, taking the form of a wind egg: *HA* VI 2, 560b11–12). As to the logical 'half' of the meaning, the verb συλλαμβάνω covers both senses of the *definition*: a) logical, as the coupling of differentiae with genus—defining the *concept* (*Met.* III 3, 998b28–29; VII 12, 1037b30–31); and b) ontological, as the coupling of form with matter—defining the *conception* (*Met.* VII 10, 1035a25–26; VII 15, 1039b21–22; cf. VI 1, 1025b32–33; X 9, 1058b2; τὸ συνειλημμένον as *concrete* particular: *Met.* VII 10, 1035a23; VII 11, 1036a27).

282 Conception is the spatial externalisation of the concept. While the concept is the pre-spatial εἶδος, the conception is the εἶδος that came out into space (through the intervention of causa efficiens, as a sort of subinfimal differentia, see above, n. 152). Cf. the previous note.

283 ἀπὸ τοῦ τελευταίου τῆς νοήσεως

8.2.3 It should also be observed that the conception phase takes place outside time,[284] in the dimension of pure (transcendental) spatiality; while the start of life of a particular empirical individual can only be counted from the beginning of its own temporal duration, from the establishment of its individual timing, that is to say, from the moment of its generation (birth or artificial production). The conception phase (from the point to the solid) would therefore be the phase of a *transcendental constituting of pure privation*, a spatial projection of the pure pre-sensible εἶδος, a three-dimensional description of the pure transcendental armature of the sensible-bodily individual destined to come into being.[285] This central, mediatory phase (the establishment of which constitutes the specific task of intelligible matter) appears—to use a metaphor taken from the domain of river and canal navigation—as a sort of *ontological lock chamber*. For just as the real chamber of a lock constitutes in itself a sphere of pure

284 That is to say, independently of local matter, time being a measure ('number') of locomotion (see above, n. 180). Although conception, being purely intelligible, is not itself capable of establishing time, which only begins with generation (see above, n. 245), the pre-sensible conception and the sensible generation, while *following one after another in terms of logic*, yet paradoxically *coincide in terms of time*: having no time-beginning of its own, the conception (at the final stage of the perfected solid) nevertheless *attaches* to the time-beginning of the generation. Thus the beginning of time ultimately becomes the joint property of both the completed conception and the inceptive generation.

285 By introducing a clear distinction between conception and generation, and assigning to conception the role of a type of ontological prelude to generation, Harvey (though seemingly unaware of the fact) speculates precisely in terms of the ancient Aristotelian στέρησις: his *conceptio* is in reality an ideal measure of an expected full substantial achievement (accomplished generation, or the birth of a new specimen of a species), which again can both take place and fail. So the particular attention of the English scholar is drawn by a special case of abortive, failed or false conception (e.g. wind egg, *ovum subventaneum*, see above, nn. 154 and 281), a curious phenomenon making conception essentially ambivalent: paradoxically open to both existential outcomes (see above, n. 268). Such an existentially neutral and indifferent status of conception, as an ontological condition of both generation and non-generation (= abortive or apparent generation), first of all excludes the possibility of an automatic identification of conception and generation: '[F]or Harvey, generation and conception are different things. Indeed, *De conceptione* begins and is motivated by non-generation and, in particular, the perplexing issue of false pregnancy. [...] In his view, false pregnancies are conceptions. [...] Of course this is what Harvey proposes for all conceptions, fruitful or not, yet the idea of the "mere conception" enables him to include non-generative conceptions in his understanding of what happens inside the body after sex. To read it in the terms of Harvey's own analogy, an artist might conceive an idea, suffering the pangs attendant on artistic process, but, then, not generate the work' (Davis 2019, 1327–28). See above, n. 278.

privation, operating as a common medium for both the absence and the presence of a body of water which will ultimately allow passage from one level to another of the same trajectory; so the conception phase acts as a peculiar *lock chamber of substance*—that common medium of both the absence and the presence of the sensible body, allowing ontological navigation from the 'lower level' of the pure nonsensible spatiality of the exteriorised εἶδος to the 'upper level' of the full-blown sensible spatiality of the individual substance (τόδε τι); or again regressive navigation in the reverse direction (i.e. starting with the ontological 'drainage' of the sensible mass from the 'lock chamber' of the substance).[286]

8.2.4 Staying for a moment with the lock chamber metaphor, we may also observe that the whole of the real lock navigation ultimately derives from the broader *principle of communicating vessels*, which lies at the physical basis of the functioning of every lock chamber system. According to this analogy, nature and the craftsman would in a way constitute the *authorised executors or administrators of the communicating vessels principle* applied to the domain of natural or artificial beings respectively. For just as the water released into the empty lock rises until its level equals that of the upper pound, and then stops rising and stabilises reaching the steady-state of entelechy, the right size of filledness; so too nature and the craftsman 'infill' their empty ontological lock chambers—their nonsensible, purely conceptional (only spatially conceived) εἴδη—with appropriate sensible stuffing, by gradually completing the process all the way up to the necessary ontological level, allowing the thing eventually to be born and then progressively receive all the quantitative, qualitative and locomotor properties befitting it. This is how a thing attains its steady mature level of full sensible materialisation, enabling it to functionally integrate itself into the rest of the sensible world outside the 'upper gate' and to freely 'overflow' and 'immerse' into it as an equal organic ingredient of the world's continuum. Yet in the realm of both natural and artificial beings, it

286 Cf. *Phys.* IV 1, 208b1–8; 209a9–10. The lock chamber simile also makes it easier to visualise Aristotle's claim that the substance in a state of readiness to come into being, which is a state of privation proper, must already as such *contain some part of the future whole*, some critical residue, ἔσχατον (= the minimum amount of positive sensible matter, *Met.* VII 7, 1032b28–1033a1; see above, n. 101). So likewise, the lock chamber in the phase of *total privation* still—or *eo ipso*—contains the *minimum residue* of the water mass, equal to the 'lower level' (in front of the 'lower gate'). As a residual part of the future whole, this critical minimum, then, increases all the way to the 'upper level' (in front of the 'upper gate'), when the state of privation is abolished and the lock chamber filled with the total amount of the body of water.

is always *sensible matter* that plays the role of the ultimate arbiter deciding whether the law of communicating vessels will be enforced without obstacles, or will remain—for some unforeseen reason—unfulfilled, unrealised or only partially realised (resulting in abortive, stunted creatures arrested halfway towards full-blown entelechy).[287]

8.3 Now let us finally turn our gaze to the toy. Here we first observe that the formation of this type of substance goes up to a certain point in phase with the formation common to the objects of the animate and inanimate worlds. At the first stage of the formation process, all things exhibit one common trait: the fertilising touch of causa formalis never involves the whole of causa materialis, but only the uppermost tier that is specifically responsible for *conception* and it alone, namely, intelligible matter. This, on the other hand, has no jurisdiction over *generation*, which falls within the specific competence of the bottommost among sensible matters, matter for substantial change. At the stage of conception, therefore, the toy shares the fate of all things. Just as the horse εἶδος potentially contained in the mare's egg emerges into space with the moment of conception caused by the sperm of the stallion; so does the same εἶδος—this time potentially contained ἐν τῇ ψυχῇ of the ποιητής of a horslike toy—come out into space with the moment of conception caused by the creative will of the toymaker. So far as intelligible matter is concerned, the real horse and the

287 At length, we may ask the following question as well: which of the Aristotelian causes will be specifically in charge of implementing the ontological 'law of communicating vessels'? The truth is, though, that it cannot be only one of the quadrivium (say, causa efficiens alone). The ultimate cause of the entelechisation of a natural or artificial substance is always *all the four causes acting in synergy*.

Hence an even more illuminating hydraulic metaphor for substance attaining its sensible entelechy would perhaps be that of the *suction pump*, the latter being taken as a set of four functional components working synergetically: a receding piston playing the part of causa efficiens; a hollow ('transparent' and purely 'intelligible') cylinder chamber (= a transcendental, schematic 'syringe') representing both causa formalis and causa finalis; and an incoming fluid assuming the role of causa materialis—the sensible filling 'erotically' drawn upwards by the apophatic vacuum of the unmoved mover. For it is by being lovingly desired that the Aristotelian God ultimately sets all beings in entelechising motion—the immediate manifestation of the overall *amor dei* (κινεῖ δὲ ὡς ἐρώμενον, *Met.* XII 7, 1072b3). Yet the role of the *proper mediator and operator of the divine void* (= of those isolated 'particles of privation'—concrete spatial enclaves of the apophatic essence of God paradoxically inserted already within the sublunary realm) is mainly assigned to the efficient cause, that is, to nature ('semen'), as well as to the human maker (= the 'retreating piston' of the 'ontological pump'). Cf. above, n. 262 (where 'negative information' would basically equate to the 'particles of divine void' referred to in the present note).

toy horse show no substantial difference: first of all, neither has been hitherto generated but merely conceived, i.e. spatially exteriorised and haecceitised, provided with an inalienable portion of physical space allotted to it for lifetime use. Yet coming into space should in no way be confused with coming into the world. Hence, being so far actually unborn, stuck in a sort of ontological limbo, neither of these only conceived horses has yet come into contact with any of the sensible layers of matter. The sole exception, indeed, is local matter, that most attenuated among sensible matters,[288] also possessed by the objects of the supralunar world (which are certainly ungenerable and incorruptible as well). Intelligible and local matters would consequently be the only material layers that all things, without exception, participate in—the only kinds of matter that matter. For all of them, supralunar and sublunar alike, including toys themselves, which occupy a sort of a mean between the two worlds, inhabit at least a portion of space, and, being thereunto localised and put into locomotion, move in one way or another (viz. spontaneously or non-spontaneously). In this regard, neither will our pair of horses, real and toy, be an exception: both represent the same horse εἶδος that went out into space, took its proper share of spatial extension, got individuated, as well as localised, and accordingly exposed itself to the possibility of a 'collision' with other individuals of its own and other species. Thus, inasmuch as intelligible and local matters are concerned, there will be no essential difference between a real horse and a toy horse. Both are spatial and mobile in exactly the same manner. In all of this, it is precisely the layer of intelligible matter that ultimately makes it possible to *identify* them, individually as well as in a reciprocal relationship. For the same layer of substance that identifies a real horse as a 'horse' allows us to do the same with the toy horse as well: each of the two is a 'horse', both equally partake of the unique equine εἶδος. Although distinctly different and incompatible in all that relates to their sensible materiality, they are still completely matched, in fact *absolutely identical* on a level of intelligible matter. And this, in turn, is nothing but the very reference level for the eidetic identity of the two.[289] It is in

288 Ross 1923, 167.

289 '[T]he animal painted in the picture is both an animal and an image, and albeit the same and one, it is also both of two, although the being [τὸ εἶναι] of the two is not the same, and it [= the painted animal] can be considered both an animal as well as an image [viz. separately]' (τὸ ἐν τῷ πίνακι γεγραμμένον ζῷον καὶ ζῷόν ἐστι καὶ εἰκών, καὶ τὸ αὐτὸ καὶ ἓν τοῦτ᾽ ἐστὶν ἄμφω, τὸ μέντοι εἶναι οὐ ταὐτὸν ἀμφοῖν, καὶ ἔστι θεωρεῖν καὶ ὡς ζῷον καὶ ὡς εἰκόνα, *Mem.* 1, 450b21–24; Bekker for no clear reason athetises 'ζῷον' in 'γεγραμμένον ζ', perhaps having in mind the noted instance of 'homonymy' in the first lines of the *Categories* (*Cat.* 1, 1a2–3), which would suppos-

virtue of this default level that we are also authorised to mutually identify a real horse and a toy horse, the two items of the self-same εἶδος.[290] For even the most persistent denier of any affinity between a real horse and a toy horse will be forced to admit the two to unerringly and irreproachably coincide in at least one point: both are after all still a horse *in some sense*. And this 'some sense' is precisely that of joint participation in the common εἶδος—of the simple *sharing the common horselike shape*,[291] which is in itself the utmost criterion of the eidetic identity of the horse as horse.[292]

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edly make 'ζῷον' redundant; cf. Bloch 2007, 33 n. 16, 69; Sorabji 1972, 84). Although differing ὕλῃ ('materialiter'), the two ζῷα, real and painted, are εἴδει ('formaliter') one and the same. See the following note.

290 At this level, there is also no substantial difference between the toy and the drawing. The drawing is only a half-perfected solid whose constitution was arrested and suspended in the second dimension; or, more properly, regressed back to the second dimension by means of a planar projection of the solid, its secondary 'flattening', or display in a foreshortened view (ἐκ πλαγίου, Plato, *Rep.* X, 598a). As far as only intelligible and local matters are concerned, there is no essential difference between the real horse and the drawn horse: both are set in a concrete space (the drawing, indeed, having only been 'telescoped' into two dimensions), and both are equally movable in this same space (the drawn horse being transferrable from one place to another together with the sketchbook in which it is drawn, so piggybacking on it, in a way). Given the first two overlays in an anatomy book of nature (= intelligible and local matters), there is therefore no difference between a real horse, a toy horse and a drawn horse (nor even a horse spatially described by the gestures of the mime's palms—a pure intelligible, transcendental horse; see above, n. 219). This pair of 'pages' is common to all the said substantial modes of the horse. Differences only occur in the following, lower sheets in the book of nature (matter for alteration, matter for growth and diminution, matter for generation and corruption). While the subjacent material layers of the real horse (the one made of flesh and bone) are completely appropriate, those linked up with the toy horse (made of wood, plastic or plush), or the drawn horse (made of graphite or ink applied onto paper), or the mimed horse (made of air), are all inappropriate and constitute no natural 'supplement' to the first two matters (see above, n. 101).

291 τὸ εἶδος, ἢ ὁτιδήποτε χρὴ καλεῖν τὴν ἐν τῷ αἰσθητῷ μορφήν, *Met.* VII 8, 1033b5–6; cf. V 8, 1017b24–26. The two are used more or less indifferently (cf. e.g. *Cael.* I 9, 278a14–15: εἶδος καὶ μορφή ... μορφή τις καὶ εἶδος, καί meaning = ἤ).

292 As long as it retains the last recognisable contour of its εἶδος, or its solid shape, a thing is inviolable (according to the law of identity; for the violation in the strict sense concerns only the solid shape of a thing, that most staunch keeper of the thing's identity). When, at the moment of the critical violation, it loses the last discernible trace of its εἶδος, or its solid shape (= after most of the fabric of πέρατα has been unravelled or torn), a thing ceases to be *it itself*, αὐτὸ καθ᾽ ἑαυτό—its identity dissolves. As long as there is a solid shape, there is no violation; as soon as there is a violation, there is no longer a solid shape. (This is where the difference between violation and mutilation would lie, cf. *Met.* V 27, 1024a22–24.) Cf. below, n. 300.

Thus, insofar as a substance is actually a form or a shape of an individual thing (συμβαίνει δή ... τὴν οὐσίαν λέγεσθαι ... ὃ ἄν τόδε τι ὂν καὶ χωριστὸν ᾖ· τοιοῦτον δὲ

8.4.1 Although coinciding on this highest and most abstract material layer—being εἴδει the same—the real horse and the toy horse will normally diverge in everything else, everything that goes beyond the realm of pure conception and falls within the purview of generation and all it consequently gives rise to: the totality of sensible properties and accidental changes that are normally made possible by sensible matter alone. So the sensible layers of matter, qualitative, quantitative, as well as generative, turn out only to be appropriate in the case of a real horse: it is here alone that a horse εἶδος becomes endowed with all the features proper

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ἑκάστου ἡ μορφὴ καὶ [= ἤ] τὸ εἶδος, *Met.* V 8, 1017b23–26; τὸ εἶδος, ἢ ὁτιδήποτε χρὴ καλεῖν τὴν ἐν τῷ αἰσθητῷ μορφήν, VII 8, 1033b5–6), the *transubstantiation* of an individual thing should of necessity entail its automatic *transformation* (μεταμόρφωσις), or the substitution of one shape (μορφή) for another. Yet again the classic Thomist teaching on transubstantiation is difficult to reconcile with the original Aristotelian claim of *the ultimate identity of substance and shape*. Aquinas' transubstantiation does not involve transformation: bread and wine retain the shape of bread and wine even though their substance has been replaced by the substance of the body of Christ (*patet quod dimensiones panis vel vini non convertuntur in dimensiones corporis Christi, sed substantia in substantiam*, *ST* III^{a}, q. 76, a. 1, ad. 3). Indeed, sacramental truth defies the natural order, i.e. the law of identity, which would otherwise not allow the simultaneous existence of two different substances—that is to say, two different shapes—in the same place. All the more so, any *secular* attempt at miraculous transubstantiation (for those not miraculous boil down to the trivial transformations of everyday experience) would eventually have to fall short (see above, n. 53): changing the substance while maintaining the shape—this certainly does succeed in the case of the transubstantiation of sacramental bread and wine into the flesh and blood of Christ, but would be most difficult to implement when it comes to, say, an oak tree or a glass of water, as in the notorious installation *An Oak Tree* (1973) created by conceptual artist Michael Craig-Martin. *The main reason is that the artist is not God*, so he cannot act contrary to the law of identity, which is the sole prerogative of the gods (one need only recall the countless transubstantiations of the amorous Zeus). Although the artist insists on the full entelechy of his oak tree, the plant is in fact only present potentially, as a pure privation of an oak tree: an oak tree that has yet to be actuated through the glass of water. The glass of water is therefore found in the very same position as the heap of bricks and wood once redefined as a partial, residual house and intended to be actuated as an integral house (or a disease once redefined as a partial, residual health intended to be actuated as integral health, see above, n. 101): this glass of water is thus in fact only a *part* (ἔσχατον, residual minimum) of a future fully actuated oak tree—a potential oak tree destined to reach its entelechy at some point. Yet in order for this oak tree to become actual, its solid shape (Thomist *dimensio*) would, according to the law of identity, have to remove the solid shape of the glass of water while indeed retaining the sensible materiality of the latter, its pure amorphous glassiness and wateriness. Hence it would end up in a kind of oaklike object wrought in an inappropriate matter such as glass of water, quite similar to a horselike object wrought in wood or plush—a sort of oak tree toy made out of a glass of water (perhaps a hollow glass toy in the shape of an oak tree, filled with water?). Craig-Martin's categorical insistence that his oak tree is actual rather than potential expresses the usual impatience of the conceptual artist to proclaim what is only conceived as already born. Cf. above, n. 285.

to a horse of flesh and bone. For when it comes to a toy, the same εἶδος (alongside its pure mobility in space) associates with certain entirely inappropriate sensible matters: thus wood, plastic or plush will be found in the place of flesh and bone, while instead of the generability and corruptibility inherent in the full-blooded animal, there will be generability and corruptibility characteristic of a wooden, plastic or plushy artifact. What we are dealing with here is therefore a kind of *monster*, a ζῷον of teratogenic origin. Its substance, otherwise duly *conceived*, supplied with fairly appropriate intelligible and local matters, suitably quartered within a three-dimensional space and set in local movement, was, on the other side, *generated* in an entirely inappropriate and monstrous manner, and accordingly supplied with entirely inappropriate matter for alteration as well as for growth and diminution. Already a cursory glance at the toy discloses this peculiar *construction error*: surely, its *shape* is no doubt appropriate, even as its local mobility, yet everything else turns out to be completely inadequate and grossly mistaken. A toy horse is, indeed, by its appearance and eidetic identity, a horse no less than the real one, yet apart from being unerringly and irreproachably horselike and mobile, it is otherwise totally incapable of anything that would normally be feasible for a real horse.[293] This general handicap, after all, already has its retrograde effect on the very nature of toy motility: although *essentially* identical to that of the real animal, the motility of the toy is inevitably conditioned by the nature of the sensible matter the toy is generated from. That is why the handicapped, toy horse will not proceed at the spontaneous trot or canter typical of a non-handicapped breed of flesh and bone, but at a non-spontaneous, stiff-legged and puppetlike gait prompted from the outside[294] and characteristic of any wooden, plastic or plushy horse effigy. The nature of its sensible matter will also condition the very conception of a horse like this, causing it to lose its biological character specific to the horse of flesh and bone (formal causation by the sperm of a sire) and embrace a 'poietic' character proper to the artificial horse of wood, plastic or plush (formal causation by the creative will of the toymaker).

8.4.2 In virtue of such a fairly conditional substantiality (which is only irreproachable at the levels of intelligible and local matters, being completely inappropriate at all other sensible levels, including that of gen-

293 Being unsuitable for feeding, watering, grooming and shoeing, and completely unusable for towing and riding (except ὁμωνύμως, in a playful manner), the toy horse is, with all this, just as sterile as a mule, yet another dead end of the horse genus (see above, n. 70).

294 Say, by the child's hand steering the pace of his toy horse.

eration), a toy rather deserves to be spoken of as *a symbolic representation* of a thing than a thing proper: such a controversial substantiality allows the toy to be properly *conceived* and brought into space, yet not also to be properly *born* and brought into life. The toy therefore remains, in a sense, forever stuck at the stage of conception and never really generated. Being thereby spared all the accidental entourage normally emergent from the sensible layers of matter, it remains perfectly insensitive to any accidentality, always pure, schematic, in no way relativised in its canonical, Platonic authority: an unspotted three-dimensional schema, just externally attached to some inappropriate matter that could otherwise be at any time arbitrarily disposed of without the least endangering the basic substantiality of the εἶδος. For this substantiality is essentially intelligible, conceptual and schematic, remaining so regardless of whether it is realised in flesh and bone or again in wood, plastic or plush. As for a real horse, on the contrary, it is not at all indifferent as to whether its body be stuffed with flesh or with plush: for only the former sensible stuffing proves appropriate, life-sustaining and capable of supporting the full entelechy of the individual; whereas the latter appears as entirely improper and virtually impracticable, actually mortiferous.[295] And if it is even possible to imagine such a thing as a horse stuffed with flesh of plush, such an unnatural creature would solely be feasible as a toy, an equine zombie: an εἶδος which is indeed *conceived* in a perfectly flawless manner—a concrete three-dimensional shape movable in physical space—yet *never really generated*, never born, since it has only been externally attached to some arbitrary matter on which it essentially does not depend and whose destiny it does not share.[296] For, while the destruction

295 Expressed in terms of the lock chamber simile (see above, n. 286), a toy is a lock that is filled with an inappropriate body (one that prevents navigation). This above all means that the very residual minimum of such body, its shallow 'part' at the bottom of the lock (in the initial phase of complete privation, a state of maximum vacancy of the lock), is *essentially inappropriate* (see above, n. 101). What then grows from the level of the lower gate to the level of the upper gate of the lock chamber is not water (= the same natural element by which the lock chamber is surrounded on both sides beyond the gates), but something else, some other matter that only *mimics water*—say, a pile of glass shards—which as such actually interrupts and stops navigation. That is why the micro-worlds of toys (apparent 'lock chambers') and games (apparent 'navigations') are kinds of extra-worldly enclaves, ontologically isolated from the rest of the fabric of the natural and social worlds: they are inherently intrusive, unintegrated, dysfunctional and ultimately obstructive ('dead in the water'). Unlike real lock chambers, which are temporary hold-ups and essential *passage points*, toys are permanent hold-ups and essential *impasse points* on a network of life paths. Toys and games are inorganic clumps stuck in the organic tissue of life, clots in its veins (which luckily never lead to a stroke, although their unchecked exaggeration can partially affect brain function).

296 This illusion—for the impression created by the toy is an *optical illusion* in the most eminent sense of the word—recalls the one engendered by holographic projections.

of an equine body of flesh and bone involves at the same time a real 'degeneration' of the accompanying equine εἶδος (shape) itself, the de-dimensionisation and de-spatialisation of the eidetic solid and its ultimate relapse into the spatial point, as well as the further 'antimetabasis' of the spatial point (στιγμή) into the pre-spatial unit (μονάς), the eventual annihilation or death of a substance as an organic whole; the destruction of an equine body fashioned of wood, plastic or plush would in no way impinge upon the—always inorganically associated—equine εἶδος (shape), which in turn is always freely disposable and available for an optional alliance (in fact, a misalliance) with any sensible matter whatsoever, always ready to 'parasitise' it or to be transported on it like a stowaway, yet one otherwise successfully surviving every shipwreck.[297] The corruption of a specimen of a real horse leads therefore to its real substantial change: for intelligible matter (matter for coming into space) this time has been wholly ontologically coalesced with the sensible (matter for coming into the world), becoming entirely coextensive, coexistent, cosuffering and commorient with it.[298] On the other hand, the corruption of a specimen of a horselike toy does not

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Although a three-dimensional image can be 'pulled' onto a real substantial substrate (say, a hologram of the deceased person projected onto the body of the living one, as in the recent post-mortem concert by Maria Callas, whose production involved the participation of a living body double), and thereby create the illusory impression that the identity of the real substance is somehow contained in the holographic shape hanging from it; yet the fact is that this intelligible aura—which by default contains the identity of the substance—persists even after the withdrawal of the substrate, and the optional substitution of one substrate for another. This means that there is no necessary, substantial connection between the holographic shape and the full-bodied material ὑποκείμενον onto which it is projected. It is essentially the same *trompe-l'œil* produced by the arbitrary blend of the unborn and immortal 'holographic' soul of a toy and its real, generated and corruptible, yet inappropriate, body of wood or plastic. Each playtime with a toy is thus both a kind of spiritualist session and a zombie resuscitation in one.

297 The substance of a real horse rests in the inimitable individuality of its τόδε τι. The substance being numerically equal to this τόδε τι, the destruction of the latter leads *eo ipso* to the destruction of the substance itself (a substantial change in terms of corruption). On the other hand, the substance of a toy horse (although externalised, i.e. realised at the level of intelligible matter) never loses its 'secondary', Platonic character, because it is never really, entelechically realised at the level of sensible matter. Consequently, the occasional destruction of its illusory body does not disturb its true substantiality which, being essentially intelligible and 'secondary', survives every sensible breakdown, always ready to freely substitute one body for another of the same or another series.

298 In the way of the notorious 'snubnosedness' (cf. e.g. *Met.* VI 1, 1025b32–33; VII 10, 1035a4–6). While the toy horse is a substance *qua* shape, the real horse is a substance *qua* concrete combination (συνειλημεμμένον) of matter and shape (cf. *Met.* VII 10, 1035a25–30; also VIII 1, 1042a28–31).

bring about any substantial change whatsoever: its intelligible matter never actually merged with sensible matter, the only kind of matter capable of bringing about substantial change. This is why the toy horse, although conceived in intelligible matter, remains forever unborn in the sensible, consequently revealing itself *eternally conceived and never born*, and hence never dying. Immortal and incorruptible, yet spatially extended and movable along certain predetermined ('waterwheel') orbital trajectories,[299] the toy horse most properly emulates the divine substances of the celestial sphere.

8.5.1 Such a creature is distinguished by a series of paradoxical features deriving from the strikingly ambiguous nature of its substantiality, and putting the intelligible and sensible components of this substantiality in a fairly impossible relationship. Since the sensible body of the toy, albeit alien, is still somehow its own as well, the features of this body will also to some extent affect the final *perception* of the substantiality of the toy as a whole, a perception which, of course, must ultimately prove to be illusory. So we have before us the horse εἶδος which, due to the characteristic 'non-coalescence' with a body other than its own (the one endued with a sensibility that is perfectly incongruous with the nature of the real equine), has retained all the features of a pure pre-sensible, 'schematic' horse: an *unborn concept* which is indeed placed in a concrete physical space, yet without being essentially conditioned by any of the sensible properties of a concrete physical horse in flesh and bone. As such, a toy horse is the ideal keyholder of the true, canonical ratio of the horse *per se*, a reference magnitude of pure equinity which is 'neither small nor large', but 'just the right one', 'exactly as large as it is needed'—that is, absolute, since it lacks the slightest admixture of matter for growth and diminution that would render it definite and relative.[300] On the other hand, though, the toy horse

299 By definition, a toy is chiefly preprogrammed to move in a specific default manner. The definition of a toy is therefore mainly equivalent to a guide to its proper use, and this again relates in the main to regular locomotion along predefined routes (e.g. the regular orbit of a baby doll from 'crib' to child's bosom and back; whereas any other, unorthodox movement of the baby doll would in consequence count as eccentric, irregular and unauthorised). Cf. above, n. 96.

300 The toy is, accordingly, an authorised keeper of τέλος, which is normally the default measure of the thing's entelechy. Since the toy itself is not able to reach the state of its own entelechy (due to the unsurmountable gap between intelligible and sensible matters in its composition), the τέλος of the toy remains the default measure of *the pure privation of entelechy*. The toy thus embodies an eternal and eternally impracticable *task*, a perpetual privation of the entelechy promised by its externally 'proclaimed' εἶδος, its very shape projected into the phenomenal foreground of the toy like an intelligible aura which has never really coalesced and merged with the sensible rest of its substance. Since every whatness (τὸ τί ἦν εἶναι) resides precisely in this outermost

is also a horse of wood, plastic or plush: these sensible qualities determine in a way the overall phenomenality of this fairly peculiar instance of the horse strain. Even the locomotion of a wooden horse will be retrogradely conditioned by the very woodenness of the toy: the gait of this horse will not be autonomous, not stemming from its animal nature, as in the case of a real horse, but will be externally induced (by the child's hand), and typically 'wooden', 'catatonic', devoid of spontaneous initiative and quite dependent on the extrinsic drive that guides it. Its contacts with other objects will accordingly have the character of an inorganic 'billiard ball colliding' rather than an organic communication, as in the relationships between a living individual of an equine species and other animate and inanimate individuals from its environment. Nor will the inherent 'timing' of a wooden horse coincide with the biological lifespan of an individual animal, but with the duration of the individual lump of wood the toy is made of. Not stuffed with the organs of a real animal, not following their functional changes, not suffering or being healed like a living creature, the physique of the toy horse will neither experience the usual change in body temperature nor any other alteration inherent in a horse of flesh and bone. In contrast, the body of a wooden horse will share the fate of any other wooden object: the wooden horse will be apt to change its temperature like any wooden thing exposed to the effects of an external heat source, and even burn like any ordinary log, which, of course, makes the toy horse more of a participant in the class of inorganic wooden artifacts than living organisms of flesh and blood. These qualitative changes will again be perfectly matched by the quantitative ones, which, according to Aristotle, are always functionally dependent upon the alteration process: not needing nutrition, the body of a wooden horse will also be spared the intricate process of alteration and organic assimilation of a foreign element (digestion of food) which, in the case of a horse of flesh and bone, conduces to the ultimate enlargement of the individual (by increasing this very flesh and bone). This is why the quantitative changes in the illusory horse represented by the toy will, on the contrary, have the character of the mechanical enlargement and reduction inherent in any wooden artifact. Enlargement will result from the inorganic addition of wood or any other inorganic mass to the existing material bulk of the individual example of

'intelligible membrane' of the substance, its very shape (μορφή, σχῆμα = εἶδος, cf. *Met.* VII 8, 1033b5–6; VII 7, 1032b1–2; 1032b14), a specifically isolated and semi-detached position of the shape in the case of the toy entails also the specific isolation and semi-detachment of its whatness itself, a τέλος eternally deprived of accomplishment ('for the shape is a τέλος', τέλος μὲν γάρ ἐστιν ἡ μορφή, *Met.* V 24, 1023a34).

the toy, while a reduction will result from the mechanical detachment of an arbitrary chunk of the same mass. Surely, however, such a quantitative change will perforce take the form of *concretion* and *mutilation* respectively: for what is enlarged and reduced here will not be an organic horse, presented and, so to speak, overtly proclaimed, promised and pledged by the shape of the horselike toy, but the foreign matter of a symbolic representation: a piece of wood designated by the equine shape. Nevertheless, these two notions will blend into a single *trompe-l'œil*: in the toy horse, we are ultimately shown a horse that moves without moving like a horse; that is sensible without being involved in the normal sensibility of a horse; that grows without the ingestion of food, that common mediator of growth, because our horse does not need any nutrition, so it is neither enhanced by way of growth, but by concretion, nor again reduced by way of gradual organic diminution, but by mutilation, the chunks being detached from the central bulge, as in the case of the 'extremes' of any wooden object.[301] Finally, although existing, this horse has never actually been born, and, being such, it never dies either. What is generated here is only an individual instance of a toy, actually a set of horselike components wrought in wood, plastic or plush, so the apparent life of this feigned horse begins with its serial fabrication and ends with its mechanical wear and tear, a critical measure of mutilation, viz. an extreme degree of *deformation* making the general contours of the horse εἶδος (shape) no longer discernible within the foreign substrate.[302] Thus dies the individual specimen of the toy horse. But it had no substantial value anyway, it was just a heterogeneous conveyor of a shape that had never really attached to it organically. Hence the separation from the material medium did not affect the εἶδος to any appreciable extent: the latter is in any case applicable to countless other instances of the same series, its perpetuity being warranted precisely by this unlimited serial reproducibility which is not threatened by the fact that a single copy of the toy not infrequently suffers grievously from the

301 It is also impossible for such a partition to become parturition, because the horse embryo is not conceived in the body of the wooden mare, but in the head of the toymaker. Hence the coming into the world of a new toy horse individual will not have the character of diminution of the body mass of a pregnant toy mare (i.e. delivery of an adult embryo already largely emancipated from the mother's body), but the character of a serial 'casting' of yet another already adult instance of the species. Ignorant of the process of growing up, the toy thus comes into the world parthenogenetically, instantaneously leaping out of intelligible matter like Athena from the head of Zeus, already adult-sized, armed in a wholesale conceptual panoply, endowed with the full size of a conceptual standard: a spatialised and three-dimensionally solidified Divine Thought.

302 See above, n. 292.

child's eagerness to test the limits of its endurance, or again from a more creative curiosity to fathom out: *what's hidden inside?*

8.5.2 The answer to this question is always ambivalent: encouraging and disappointing in the same breath (the child is perfectly aware of this ambiguity despite all the inexperience of his tender age). Encouraging—because no matter how much he digs into the autopsied body of his wooden horse, he will never find anything to seriously jeopardise the immortality of a horse *per se*: its living heart proves not to be hidden in the shattered piece of wood, but always somehow escapes the collapse of the individual piece.[303] Disappointing—because the young researcher is always left with an uncomfortable sense of frustration: his search for essence is thwarted over and over again. Equinity always manages to avoid the child's temptation—it had never really been located inside the sensible interior of the toy. Such an impression was a sheer will-o'-the-wisp. Thus the mutilated toy both preserved and removed the εἶδος the child was so eagerly trying to grasp, leaving its small user-abuser with a paradoxical feeling of the ungraspable graspability of εἶδος[304] that, though spatially located and sensible, successfully evades every attempt at sensible location, remaining forever safely preserved and never reached—celestial, divine, eternally alive: the ever-living pledge of an ever-living order.

303 This gives the child confidence in the higher stability of the mundane condition.

304 Although he has grasped it with his mind, the child has not grasped it with his hand, and therefore he must be content with apophatic (privative) knowledge alone. This knowledge, focused on a subject that is just *conceived* but not generated as well will only have a *conceptual* character, remaining essentially 'empty'—to use the well-known Kantian phrase (Kant 1998, 193–94 = *KrV*, A 51/B 75). Conceptual consciousness, the abstract eidetic foundations of which are already laid by the first toys of the child's cradle, is thus an empty schematic receptacle ready to accept the real sensible matter of any future experience and articulate it into the entelechy of a complete mature apperception of the world (see above, n. 48).

9. Conclusion

In doing so, the toy fulfils its complex and many-sided educational role:

- to teach the general concept (imitating the Idea);
- to anthropomorphise nature (imitating the wild);
- to pluck out the sting of incalculability from the real agon in nature and society by transforming it into a bloodless bloodbath on the readily manageable battlefield of the boardgame (imitating the agon);
- to instil the conviction that substantial change is essentially a kind of *docetic* illusion (imitating the substantial change);
- to solidify the belief that accidental change is no less illusory than substantial—except for locomotion, the only change unfolding *in rerum natura* (imitating the accidental change);

  and lastly,
- to suggest the existence of an ultimate substantiality of a higher, supralunar order, one which will eventually escape all destruction and change—with the sole exception of regular perpetual revolving in a circle, accompanied by habitual eclipses and emersions from the neighbouring shadow, the so-called deaths and births (imitating the divine).

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