Part I

A) ARISTOTELIANISM AND CORPOREAL SUBSTANCES

1. Mechanism and the aporias of motion

The natural starting point for an investigation of Leibniz’s ontology is with Aristo-
telian philosophy and its scholastic interpretation. This may sound surprising at first; but Leibniz was by his philosophical upbringing and natural curiosity imbued with a polymathic inclination and assiduously studied other men’s learning for his own bene-
fit. One of his casual observations was that no thinker could possibly get it wrong so badly that nothing could be learnt from him. Conversely his early infatuation with Cartesian mechanism (acquired mostly, by the way, at second hand!) led on closer study to a cooling of his ardour and then dismay at the wholesale contempt of older wisdom evinced in the schools of the ‘moderns’. All knowledge, he maintained, is a resource; and in consequence we find Leibniz drawing liberally on the intellectual re-
sources of the schools and the ancient encyclopaedic mind.

Thus Leibniz’s thinking represents the confluence of several philosophical and ‘scientific’ (natural philosophical) streams which were current in his era. It is fairly clear that his first exposure to both physics and philosophy took the form of indu-
c- tion into Aristotle and his scholastic interpreters. There was a strong current alive in Leipzig, where he studied under Erhard Weigel and Jakob Thomasius, to retrieve the authentic Aristotle from his scholastic accretions. Another even more ‘progres-
sive’ wing, whose chief exponent was Christian Sturm, sought to adapt Aristotle to modern natural philosophy. All three of these men wrought their influence on Leibniz and witnessed his attempt to enact the philosophical nuptials between Ari-
sotelianism and the Moderns which figures in his first publication. But it is perhaps to be expected that a young man wishing to spread his wings upon acquiring independence would seek to ‘buck the system’ and affiliate himself with the new philosophy represented by such men as Galileo, Kepler, Gassendi, Hobbes and Descartes. To them, the natural philosophy of the Aristotelian-scholastic schools represented a sort of ‘closed eyes’ physics, their reliance on ‘forms’ and ‘innate tendencies’ all too often producing noth-
ing worth knowing or even outright solecisms of the ilk of the ‘dormitive principle’. Against this knowledge acquired by oil lamp, the moderns pitted a ‘billiard ball uni-
iverse’, whose superior explanatory virtue was seen in the fact that corpuscles are

1 Leibniz had no direct acquaintance with the works of Descartes prior to his Paris years. The Principles were known to him from an incomplete copy of Spinoza’s exposition; for the rest, as he confessed to Foucher, his opinions on Descartes were almost entirely derived from second-
dary literature! Foucher, A II, 1, 147, L 153.
2 The influence of this Protestant Aristotelianism on Leibniz’s development has been at the focus of much scholarly interest in recent years; cf. Christa Mercer: Leibniz’s Metaphysics: Its Ori-
sstantischen Deutschland, Frommann-Holzboog, Stuttgart 1964.
3 Daniel Garber, “Leibniz: Physics and Philosophy”, in Nicholas Jolley, The Cambridge Companion to Leibniz, Cambridge University Press 1995, p. 272. However, the term is not Garber’s coinage, but in common use in the physics fraternity, where the billiard ball (or, in chemistry, the ball and stick model) is an indispensable tool for the visualisation of chemical elements and subnuclear particles.
geometrical entities and therefore amenable to exact study in terms of their motions, sizes and shapes. In addition these new concepts involve the facilitation of experimental study to an extent not previously known, so that by the time of Leibniz’s young manhood, a considerable body of exact knowledge had been acquired – comparable in quantity to Aristotle’s, but superior in respect of its truthfulness to empirical facts.

Inevitably, the philosophical upshot of this would be a definition of matter which took account of the corpuscular nature of physical reality; and this was in due course supplied by Descartes in his notorious two-substance doctrine: that physical objects are rei extensa, and that this delineation with its attendant qualities of magnitude, shape and motion was necessary and sufficient.

This is the background to the two letters Leibniz wrote in 1668–9 to his erstwhile mentor Jakob Thomasius in which he echoed Sturm’s sentiments.4 A year later he had ready for printing A New Hypothesis of Physics, a beautifully ornate piece of science fiction a la manière de Kepler,5 which nonetheless (with the help of Oldenburg) established his credentials in the intellectual world. Moreover, some of the thoughts he committed to the world therein were destined to accompany his intellectual endeavours throughout his life, for example:

I agree completely with the followers of those excellent gentlemen, Descartes and Gassendi, and with whomever else teaches that in the end all variety in body must be explained in terms of size, shape and motion.6

We can find that thought, suitably enriched, as late as the doorstep of his final opus.

A decisive turnabout eventuated during his first visit to Paris in 1672–6. The years in Paris awoke him (to arrogate a famous bon mot) from his ‘dogmatic sluumber’. The intellectual ferment he encountered in that city changed all his perspectives and the very direction of his thinking. Near the end of this period, in 1676, he gathered a number of his jottings to make up a little book entitled Leibnitiana: Elementa philosophiae arcanae de summa rerum.7 To the reader steeped in his traditional writings, this must seem like a furnace or an alchemical cauldron, where startling novelties jostle each other with abandon. The book was never published, inaugurating another long Leibnizian tradition of keeping his ideas to himself unless they could be vetted and stamped ‘suitable for public/professional consumption’. But it was also in this period that he first discerned the fatal flaw in Cartesian physics. This was the inability of the doctrine of extension to explain motion, which led to his insight that force must be prior to extension (and ultimately, that the principle of force can account for extension).

The outcome was the conception of an entirely new philosophy in which, however, as if by the operation of a time warp, the hoary thought of Aristotle was suddenly recognised as the first stone needing to be laid down on which to rear his new construction.

4 Cf. Ch. V, supra.
5 E.g. Mysterium Cosmographicum and Harmonice Mundi, luxuriant cosmological fantasies integrating mysticism, music, mathematics, Pythagorean number lore, the doctrines of the Timaeus and the heliocentric theory of Copernicus with his own rigorously empirical natural philosophy. They contain not only his celebrated ‘proof’ that the solar system out to Saturn is constructed on the Platonian regular solids; but also his three laws of planetary motion – the latter being the source of his historical fame as a scientist. – As for Leibniz, he soon distanced himself from the contents of his work, having recognised during his Paris sojourn that its mathematics was woefully inadequate to the task.
6 Phys. nova, §57.
7 Edited and published (in part) by G. H. Parkinson – see Bibliography.
That moment of recognition deserves a paragraph to itself; and as always, Leibniz’s own description of how the defect of the Cartesian doctrine of extension became clear to him is a model of transparent simplicity. “If the essence of a body consisted in extension,” he writes, “this alone should be sufficient to account for all the properties of the body.” To discover if this is true, conceive of the following thought experiment:

Let two billiard balls meet in the middle of empty space and collide. From experience, we have a good notion of what will happen, namely that they repel each other, although exactly how this transpires depends on such factors as their relative speed and size and whether they collide head on or sideswipe each other. Without going into the technical details, these conditions determine whether the balls will move off in opposite directions or one of them will push and/or deflect the other.

For Descartes, the solution to each possible case depends on what he calls ‘preserved motion’, which God takes care to maintain in the universe. In other words, the amount of motion always remains the same; so that the quantity lost by one billiard ball in the collision is taken up by the other. Descartes gives three laws and seven specific rules which govern the transfer, of which the upshot is that a simple numerical equation serves to show that the conserved quantity is \times speed. These rules enable him to calculate exactly the amount of recoil or deflection of the objects after collision.

Now Leibniz detected a logical flaw in this argument. He writes, “if there were nothing more in bodies than extension … the [first] body after the impact would simply continue [and] carry along the [other] body”. But this is obviously not the case. Therefore extension alone cannot explain the property of motion or its transfer from object to object on impact. Hence, “considering the matter closely, we perceive that we must add some higher or metaphysical notion, namely that of substance, action and force; and these notions imply that anything which is acted on must act reciprocally, and anything which acts must receive some reaction.”

Here we have the genesis of Leibniz’s fundamental metaphysical unit, force. For it transpires from the terms of this argument that the objects have no reason for moving as they do after impact unless there is ‘in them’ some quality other than extension; and this according to Leibniz must be force – a combination of active and resistive force. What is preserved in the collision is not, therefore, the quantity of motion, but the quantity of force.

This result did nothing to shake his belief (as he reaffirms in the same paper) that extension and mechanical principles govern the study of bodies; only that the laws of physics “have a more sublime origin than those furnished by pure mathematics.”

This invites a brief appreciation of where we stand generally with the relationship between the philosophy and the mathematics of motion.

Motion is not an act, but something – namely continuous displacement – which results from an act. To be measurable, it must be fitted to a graduated temporal scale. Time must furnish a constant so as to enable comparison to a variable quantity. Measurement of motion is thus the reduction of a process to static categories and its expression in algebraic form. However, a mathematical account does not describe the mo-

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8 Ess. Body, W 100.
9 Descartes, Principles §§36-40 and §§46-52, respectively.
12 Loc. cit.
tion, only the succession of points visited by the object and their correlation to time. Mathematics and mechanism altogether thus reveal themselves as inertialisms: for the ‘time’ in this correlation, intuitively interpreted as something that ‘flows’, can be any static contrivance so long as it yields the desired constant.\footnote{Where in an experiment to test the law of acceleration, Galileo rolled cannon balls down a sloping surface that had been marked at regular intervals. Lacking a clock, he instructed an apprentice to open the tap of an urn filled with water on his first call and to close it on the second call. The water flowed into a bottle calibrated with volume indicators. By this ingenious device, Galileo established a correlation between distances travelled by his cannon balls with a certain volume of water. Accordingly \textit{volume of water} = \textit{time}! (It is easy to see how examples such as this, to which we could add egg timers, swinging pendulums and the oscillations of caesium atoms, which are directly connected with the measurement of time, invite the question “what is time, really?”)}

The essential point to be derived from this and the above Leibnizian inspiration is that the principles of mechanism alone do not suffice as accounts of the behaviour of objects in motion and collision.

\section*{2. Aristotle to the rescue}

So the ‘higher metaphysical notion’ Leibniz sought was an absentee from the natural philosophy of the Moderns; nor was the impetus doctrine of the scholastics of the slightest use to him in this exigency. Paradoxically it was the declared arch-enemy of the Moderns, Aristotle, who opened that door for him. Although Leibniz would radically modify the Aristotelian notions of force and substance when his turn came, a distinct family propinquity always persisted. It is thus appropriate, before we proceed, to cite a passage in which he acknowledged his debt to the Stagyrite explicitly:

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Whenever I discuss matters with the Cartesians, certainly I extol Aristotle where he deserves it and undertake a defence of the ancient philosophy, because I see that many Cartesians read their master only, ignoring what is held in high esteem by others, and thus unwisely impose limits on their own ability.\footnote{Conring, G I 198f., L 190.}
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Since, however, a great deal of the Aristotelian legacy entered modern western philosophy through the gateway of scholasticism, Leibniz extended the same courtesy to the thinkers of the schools, where (as he put it) the “seams of gold” to be discovered, e.g. substantial forms, make study worthwhile despite the fact that reams of their philosophising is nothing but windbaggery:

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I know that I am advancing a great paradox in seeking to restore the old philosophy in some respects and to restore these almost banished substantial forms. But perhaps I shall not be condemned so lightly when it is known that I have given much thought to modern philosophy ... [and was yet] at last compelled to return in spite of myself and as by force. This is after I have myself carried out studies which convinced me that our moderns do not do enough justice to St. Thomas and other great men of his time and that the opinions of the Scholastic philosophers and theologians are much sounder than has been imagined, provided they are used appropriately and in their place.\footnote{Disc. Met., §11.}
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\section*{3. ‘Ye olden principles’ and Leibniz’s emendations}

At this stage, it seems best to confront that legacy at once and sketch out very briefly what Leibniz’s appropriations and emendations amount to insofar as they are relevant to this chapter.

\begin{thebibliography}{10}
\bibitem{Galileo} In an experiment to test the law of acceleration, Galileo rolled cannon balls down a sloping surface that had been marked at regular intervals. Lacking a clock, he instructed an apprentice to open the tap of an urn filled with water on his first call and to close it on the second call. The water flowed into a bottle calibrated with volume indicators. By this ingenious device, Galileo established a correlation between distances travelled by his cannon balls with a certain volume of water. Accordingly \textit{volume of water} = \textit{time}! (It is easy to see how examples such as this, to which we could add egg timers, swinging pendulums and the oscillations of a caesium atom, which are directly connected with the measurement of time, invite the question “what is time, really?”)
\bibitem{Conring} Conring, G I 198f., L 190.
\bibitem{Disc. Met.} Disc. Met., §11.
\end{thebibliography}
Primary among these is his adoption of the peripatetic-scholastic notion of substance. Rutherford’s study lists five fundamental notions which also comprise the framework for Leibniz’s metaphysical researches, viz.:

1. Among created beings, only substances enjoy per se existence.
2. Substance is an entelechy or source of action.
3. Substance persists, remaining numerically identical through all changes.
4. Substance is a per se unity.
5. For any substance, there is a principle of individuation sufficient to distinguish it from every other actual or possible substance.¹⁶

All these criteria touch on the problem of being, and as a corollary to this, the problem of a persisting identity. For Leibniz, however, they exhibit certain deficiencies which require them to be augmented by others. For example, it occurred to him in the course of his studies of continuity that an inevitable adjunct of his results was the necessity for all possible substances to be created and annihilated together; accordingly

6. Substances are imperishable except by intervention of God.

He also went beyond tradition in his principle of individuation, for which he eschewed all talk of essences, haecceity and the like, substituting for them a more dynamic notion:

7. Substances are individuated by their ‘sum of predicates’.

Finally, from his possible worlds doctrine he derived the further notion that

8. Every substance ‘expresses’ the whole universe.¹⁷

There were, of course, other reasons still for Leibniz’s interest in scholastic principles. He also needed a positive counterweight to the rising subjectivism which he identified as the most dubious legacy of Descartes’ dual-substance doctrine. The concept of being must have its anchor in a fundamentum in re. This was endangered by the Cartesians’ epistemological emphasis, which promoted the idea of a privileged status – both gnoseologically and ontologically – for the ‘thinking substance’, together with a downgrading of res extensa to a status of mere and dispensable appearances. Accordingly Leibniz’s project had, by the time of the Discourse, acquired the firm agenda of reconstituting ontology from the concept of substance upwards. In this endeavour, the philosophising of the Moderns seemed defective to him and the guidance offered by Aristotle and scholastic thinking to touch the truth more closely.

4. Universals & particulars

However, although it must seem as if Leibniz, in repudiating atomism and rehabilitating substantial forms, evinced a ‘reactionary’ trend of mind towards the formalistic schools of thought and absented himself intellectually from his contemporaries, this is not actually the case. It must be seen in his context, which is the context of modernism and mechanism despite his obeisances to the tradition; a context which propelled him eventually beyond Aristotelianism and scholasticism, though keeping a foot in the door.

The point is this: Thinkers of the formalistic school attend to the forms of things on the basis of a recognition that the multiplicity of particular instances is generalisable and thereby reducible to classification by genera and species. The godfather of this philosophy was Plato in his theory of ideas; but it is a principle to which a think-

¹⁷ Ibid., pp. 136-7.
ing person might be led spontaneously without it yielding a rigorous philosophical formulation. Generalisations are the basis of real knowledge; for in order to correctly identify a particular, it is practically indispensable to have a conception of its location in a general taxonomic order.\footnote{It might be said that this generalising faculty is laid into our cradle by evolution as a survival strategy, so that we can recognise instantaneously that a snake or a spider belongs among genera whose members include a number of poisonous creatures. Conversely, the recognition of individual members comes with experience and the spread of knowledge into particulars, which allows us eventually to identify poisonous and non-poisonous members of their classes. Ernst Mayr, in This is Biology: The Science of the Living World, Harvard University Press 1997, p. 131, reported in a study of the natives of New Guinea that their spontaneous classifications of wildlife corresponded exactly with Western naturalists’ taxa – a remarkable confirmation of the fundamentality of this dual faculty in humans.}

It is another matter, however, when this recognition is transformed into a philosophical principle and the generalisation, or universal, accorded a different existential status from particulars – such that an idea or form which is perceivable as the common appearing feature among particulars, is assumed to represent actual and/or ultimate reality, with particulars or phenomena demoted to a merely borrowed reality.

Telescoping into one brief statement the philosophical debates on this question which animated scholasticism for some 300 years in the so-called ‘nominalist dispute’: the conceptual divide concerned the issue of what we may understand by the locution ‘existence’ in relation to universals. Nominalists averred that they are nothing but names, labels, group concepts; but nomina do not have existence nor can they confer existence. Existence is therefore reserved to particulars, and thus every idea, form or concept must ineluctably refer back to an actually existing particular from which to draw its legitimation. The clause ‘actually existing’ is important, inasmuch as forms or concepts may well refer to non-existent things or even things that cannot have existence (Leibniz cites centaurs and golden mountains as specimens). – It may be said that in the long haul, the nominalists triumphed; and this affected in the modern era the understanding of substantial form, which the generation brought up on Cartesian philosophy held to be the epitome of confused and sterile thinking.

5. Individuation

However, the way this issue presented itself to the mind of Leibniz was in the context of the substance as an individual – which on the face of it makes him a nominalist. But this is hardly a relevant consideration in his context; for with the specification of the simple substance, or monad, Leibniz effectively took the wind out of the sails of dispute by obliterating the difference between genus and particular. And in that same stroke Leibniz settled another major scholastic dispute, between the Thomists and the Scotists, on individuation. For to the scholastics it was the genus that possessed formal substantiality, whereas matter ‘received’ so much form as it was pre-disposed to accept, while similarly an individual was understood as incorporating it. The difference between Thomists and Scotists was that the latter took haecceity as the principle of incorporation, the former quiddity – a distinction readily seen to be dissolved by the doctrine of monadism.

In this latter respect, then, Leibniz went beyond scholastic notions by scuttling their irrelevant aspects, while retaining substantial form as an indispensable item in his armoury of concepts. Plato and Aristotle’s conceptions thereby reached their apogee
in reconciliation – an expression which Leibniz would have welcomed. His monads represent both the eternal forms of Plato and the entelechy, or natural force, of Aristotle.

6. Corporeal substance: matter

As we now turn to an account of his ontological foundations in which a great deal of this legacy has metamorphosed, we encounter a subject matter full of Aristotelian overtones, yet at the heart of Leibniz’s thinking – the concept of a corporeal substance.

Corporeal substance is, with substantial form, one of the termini technici from the peripatetic-scholastic canon for which the Moderns had virtually no use. But one place where these notions abound is in the Arnauld correspondence, which is in many respects the seminal document in the maturing of Leibniz’s philosophy. In giving Arnauld his account of corporeal substance in Aristotelian terminology, while the general ductus of the interchange was on the level of Cartesianism, Leibniz would not have been surprised to receive some impatient replies to the tune that ‘this is old hat’. For Arnauld’s Cartesianism did not preclude, of course, a profound immersion in both the Scholastic and the Aristotelian traditions. And he would have been fully familiar with the distinctions common in that tradition between primary and secondary matter which appears, for example, in a standard textbook of Eustacius a S. Paulo:

Primary [matter] is said to be that which, before all else, we conceive as entering into the composition of any natural thing, regarded as lacking all forms, [while] Secondary is said to be that very primitive [matter], not, however, bare, but endowed with physical actuality.\(^\text{19}\)

We recognise in this an idea rooted in the very beginnings of western philosophy – e.g. in Anaximander’s apeiron from which matter precipitates by apokrisis whereby it acquires temporal actuality.\(^\text{20}\) Hence when we speak of ‘matter’ in ordinary discourse, it is the simple, formed secondary substances of the Eustacius passage we refer to: the stuff from which the mundane objects of the world – the bricks of houses and the cloth of suits – are made. And thus to Leibniz, whose objections to the Cartesian notion of matter are spelt out as follows:

… extended mass, considered without entelechies … is not a corporeal substance, but an entirely pure phenomenon, like the rainbow; therefore philosophers have recognised that it is form which gives determinate being to matter.\(^\text{21}\)

The ‘entirely pure phenomenon’ of this terse pronouncement will elicit more comment in due course; but first we must attend to three intriguing features arising out of the passage. Firstly, that corporeal substance is not merely a unity of aggregation but requires the work of a form-giving entelechy to be recognised as such. By this we are, secondly, apprised of this unity as comprising secondary matter collections, an understanding reinforced later in the same passage by the words “… secondary matter, which is the multiplicity of substances of which the mass is that of the total body.” But thirdly, there is a surprising omission of any discussion of primary matter. One might have expected a thinker steeped in medieval philosophy to have something to say

\(^{21}\) Arnauld, LA/G II 119.
about it; yet he doesn’t – indeed the passage highlighted a moment ago effectively amounts to repudiation of primary matter.

It transpires that Leibniz was never a friend of the primary matter concept. He regarded it as one of those illicit abstractions which are rife in scholastic philosophy and leave us with a sense of ‘nothing we can point to’ and ‘what exactly are we talking about?’ In a post-Parisian definition of corporeal substances we find that “we can show from the inner truths of metaphysics that what is not an active thing is nothing.”22 And herein lies the answer to the seeming paradox of the “entirely pure phenomenon” which was earlier alluded to, for the extended mass of the above passus is nothing other than primary matter. As far as Leibniz is concerned, that very notion is a non-sequitur – what can one possibly say (let alone by way of ‘definition’) about a primary matter that totally lacks form?

To Arnauld, he makes a concession, though only by way of analogy. He refers to ‘primitive passive power’ (potentia) as cognate with the Scholastics’ primary matter; but in doing so merely disguises the fact that they are qualitatively incompatible, and further that in his philosophy potentia is an essential constituent of substance whereas there is no place for primary matter.23 At best therefore, the latter will serve as a nomen for ready occasions – as a cross-reference to scholastic thinking habits. So when he writes in another place, “The primitive force of suffering or of resisting constitutes the very thing which the scholastics call materia prima, if rightly interpreted”, the qualification at the end insinuates that the scholastics did not rightly interpret it.

Primary matter having thus been disqualified, it is secondary matter that enters the specification of body. Secondary matter, as noted, is the bric-a-brac of material reality; but it also answers positively to Leibniz’s disclaimer, “what is not an active thing is nothing”. For the time being we need to abridge into one sentence what is going to be dealt with in detail later on, viz. that for Leibniz any item of the world’s furniture with claims to real existence is an instantiation of the principle of activity, or force. Leibniz identifies its two characteristics as passive or inert and active or striving. In matter both principles are conjoint, as principles, so that we have here “matter taken as a complete being”.24 Matter is not, of course, body, although body comprises matter; and therefore body is likewise a composition of active and passive force. From this we can see that for Leibniz matter and body are cognate but not identical; the differentiation determines for naked matter (mass) the predominance of the passive principle of anti-stypia, or the quality of resistance to penetration, while body comprises matter plus active force.

The upshot is that secondary matter and body all denote aggregates of simple substances (later: monads). To clarify this a little further, ‘body’ is always the material (or phenomenal) component of a substance. But when Leibniz refers to bodies as ‘organic machines’, as he frequently does, a specific distinction is involved. The latter are aggregates of bodies – irrespective of whether they comprise a blade of grass or a blue whale – held together by a dominant monad, whose presence marks the distinction between animate and inanimate bodies. The dominant monad acts as the entelechy of the body, while the complete corporeal substance – a compound of the dominant entelechy and its body – comprises by itself or as a member of a collective, the organism or

22 True Meth. A V lii 158; W 64. (italics added). These should be compared with the final clause of his paper “Motion is Something Relative”, see Part III, Note 130 infra.
23 Arnauld, LA/G II 120.
24 Nouv. Ess. 4, iii, 6 (p. 378).
complete animal, which in the case of a human of course includes a superordinated dominant entelechy which we call 'soul'.

7. Corporeal substance: soul & body

From here we may proceed to Leibniz's definition. “I call that a corporeal substance which consists in a simple substance or monad (that is, a soul, or something analogous to a soul) and an organic body united to it.”

Implied in this is that “corporeal substance has no definite extension.” But this must be augmented with another statement of somewhat puzzling import, namely that

one cannot fix on a part [of matter] so small that there are no animate bodies within, or at least bodies endowed with a basic entelechy, or (if you permit one to use the word ‘life’ so generally) with a vital principle, … [so] it may be said in general of them all that they are living.

This suggests rather strongly an animist persuasion, which is not in fact Leibniz's intention and must therefore be explained by his recourse to another Aristotelian-scholastic distinction. At the bottom of it rests the concept of a substantial form which denotes a ‘soul’, but does not include in its definition a provision for this soul to be alive (perhaps, being a form only, this is self-understood?). For the principle of life is only associated with organic bodies; rocks, wax and water do not possess a substantial form. What is crucial, then, is to understand Leibniz as saying that material objects may contain corporeal substances, without being themselves corporeal substances. Thus:

It is true (according to my system) that there is no portion of matter in which there is not an infinity or organic and animated bodies; among which I include not only animals and plants, but perhaps other sorts as well, which are entirely unknown to us. But it is not right to say, on account of that, that every portion of matter is animated – just as we do not say that a lake full of fish is an animated body, although the fish is.

Corporeal substances are living things, animation being conferred on them by their possession of a substantial form which is the soul plus secondary matter:

Every substance has within it a kind of operation, and this operation is either of the same thing on itself, in which case it is called reflection or thought, and such a substance is spiritual, i.e. a mind; or it is the operation of its various parts, and such a substance is called a corporeal substance.

… assuming that there is a soul or entelechy in animals or other corporeal substances, one must argue from it on this point as we all argue from man, who is an entity endowed with genuine unity conferred on him by his soul, notwithstanding the fact that the mass of his body is divided into organs, vessels, humours, spirits, and that the parts are undoubtedly full of an infinite number of other corporeal substances endowed with their own entelechies.

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26 Wonders, A iv 279, LoC 263. (This is going to become a sticking point in his later efforts to upgrade the corporeal substance known as a ‘human body’)
27 Arnauld, LA/G II 118.
30 Arnauld, LA/G II 120.
This description does not seem to leave much room for the interpretation occasionally met with, that Leibniz’s metaphysics boils down to a kind of panpsychism. But there is a problem in this passage – for it insinuates an infinite downward spiraling of substances without a first term to break up the regression – which Sleigh draws out of the debate with Arnauld:

The corporeal substance theory maintains that there are infinitely many created soul-like entities – some spiritual, some not – each of which is the form of some corporeal substance. It maintains that each corporeal substance is a complete entity, consisting of an aggregate of (other) corporeal substances (that is, its organic body), all of which are combined into a single individual with true substantial unity by a soul-like entity – the substantial form of that corporeal substance. So each corporeal substance involves an infinite descent, in the sense that each corporeal substance is composed of other corporeal substances, each of which is similarly composed – without end. Furthermore, the entire created world may be decomposed into created corporeal substances. 31

No doubt there is a certain amount of obscurity in this idea which does not readily yield to simplifying accounts. For on the one hand it is clear that Leibniz has no intention of stopping infinite regress, the primary argument being that corporeal substances are, literally, infinitely divisible. On the other hand, the regress does effectively stop once we have reached the level of pure-force substances, i.e. the domain of monads. But unless we wish to impute self-contradiction to him (which is always a temptation in scenarios where the ‘labyrinth of the infinite’ comes into play), the only avenue towards clarification rests with the differentiation between ‘literal’ and ‘ideal’ infinity. In terms of the former, one has then to imagine that in descending from level to level on the continuum, the amount of material force will gradually diminish until it fades out. But this is equivalent to judging the concept of matter by recourse to the dimension which we inhabit, where extension is by definition divisible, and where we are tempted to equate divisibility with an in-principle numerically endless procedure. But according to Leibniz, in dimensions beyond the reach of this macroscopic perspective, the difference between ‘matter substance’ and ‘mind substance’ becomes smeared out to the point where the distinction is no longer meaningful. Matter substance divisibility in fact converges on a limit; it is not literally endlessly divisible.

The meaning of all this is problematic enough within the doctrines of Leibniz. He may have been ‘guessing’ at something that remains maddeningly elusive to human cognition and imagination – trying to tease out of the mind of God how the Almighty might ‘perceive’ this construction, to whom the binary division of reality into mind and matter would be in any case be a senseless construal. Examples that could be offered in explanation to a contemporary reader would be the non-dimensional particles (zero momentum, zero mass etc.) which are encountered in particle physics and leave their visible calling card, without actually being detectable in themselves – analogues of ‘physical’ states converging on a limit. Compared to these counter-intuitive complexities, Leibniz’s answer to the conundrum strikes us as relatively meek. In First Truths he reveals that

31 Robert Sleigh: Leibniz & Arnauld: A Commentary on their Correspondence, Yale University Press, New Haven 1990, pp. 98-9. However, the assertion of the last sentence is highly dubious, for it implies the prior creation of a world in which we then find corporeal substances. But the gist of Leibniz’s thinking is that there is no prior world, for the monads comprise it. So there seems to be a misunderstanding at work here about what the world is in Leibniz’s ontology.
for corporeal substances there is something required which lacks extension; otherwise there would be no principle to account for the reality of the phenomena or for true unity. There would always be a plurality of bodies, never one body alone; and therefore there could not, in truth, be many.\footnote{First Truths, Ct, 518ff, L 270.}

This unnamed unextended item is “something like a soul, which was once called a form or species.” But with this we are firmly returned to the Aristotelian context, where notions of the continuum are still relatively tidy, home-grown products of enquiry. But how Leibniz endeavoured to expand this cluster of ideas into a doctrine which seems almost to anticipate the kind of physics language we speak today, is the subject of extensive discussion later on, and it must for the time being suffice to have drawn attention to it.

8. Composite substance

Now in respect to animatedness, it is a peculiarity of Leibniz’s account that he nowhere enlarges significantly on the difference between animate/organic and inanimate/inorganic. As a rule he contents himself with specifying that (animal) bodies are identified by the possession of organs, hence that they are organ-ised in a way that material bodies are not.\footnote{Cf. Richard M. Adams: Leibniz: Determinist, Theist, Idealist. Oxford University Press, New York 1994, p. 263: “I have found little explanation in Leibniz of what distinguishes organic from inorganic bodies. It is not a radical difference in the kind of causality that operates in them. Leibniz always insists that everything can be explained mechanically in organic as well as inorganic bodies. … Presumably an organic body is one so organised mechanically that it continues over time to cohere and retain a sort of unity in physical interactions. But stones have that property too …”} But here as in so many aspects of Leibniz’s philosophy, there are residues of implied explanation lurking behind the curtain. In this instance we need merely recall the primordiality of force and that inorganic bodies are characterised by passive force (\textit{inertia}) and organic bodies by active force (\textit{nissus}). In an animal, organicity is therefore relevantly expressed by noting that its organisation brings to the fore a new and uniquely agency-related character trait, namely co-operation among the organs which facilitates identification of the animal as an organic holon. An animal is thus not simply an aggregate of corporeal substances, but (if one may coin such a term for it) a corporate structure and, as such, a teleologically driven identity.\footnote{In train with the several observations made in this study of Leibniz’s continued refinement of certain notions and principles, it is not out of place here to mention that in his later years, he becomes more insistent on differentiating between \textit{body per se} and corporeal substance as body (cf. Adams, op. cit., p. 264). His final position is accurately reflected in the above phrase “an animal is not an aggregate of corporeal substances”, i.e. it is not a substance itself. In a sense this is self-explanatory, since the bodies of creatures and vegetation are endowed with immense complexity of function and organisation, in which respect they go much beyond the relatively simple definition of a corporeal substance. The purpose of drawing attention to this is, primarily, that Leibniz has his moments of descriptive sloppiness and sometimes forgets what he wrote earlier or assumes without mentioning anything that his reader is acquainted with his earlier writings. Accordingly one can, here and there, find statements from his pen which convey the notion that corporeal substance can be understood as body in the sense of ‘animal/plant body’. Such ambiguities must, unfortunately, be taken on board and dissected as appropriate to the context in which we find them.}

This seems to be an appropriate place to insert Leibniz own summation of the structure of corporeal substance. It should be noted at once that this can hardly stand as Leibniz ‘last word’; but it is a widely quoted statement and often taken to be definitive:

\footnote{32 \textit{First Truths}, Ct, 518ff, L 270.}

\footnote{33 \textit{Cf. Richard M. Adams: Leibniz: Determinist, Theist, Idealist}. Oxford University Press, New York 1994, p. 263: “I have found little explanation in Leibniz of what distinguishes organic from inorganic bodies. It is not a radical difference in the kind of causality that operates in them. Leibniz always insists that everything can be explained mechanically in organic as well as inorganic bodies. … Presumably an organic body is one so organised mechanically that it continues over time to cohere and retain a sort of unity in physical interactions. But stones have that property too …”}

\footnote{34 In train with the several observations made in this study of Leibniz’s continued refinement of certain notions and principles, it is not out of place here to mention that in his later years, he becomes more insistent on differentiating between \textit{body per se} and corporeal substance as body (cf. Adams, op. cit., p. 264). His final position is accurately reflected in the above phrase “an animal is not an aggregate of corporeal substances”, i.e. it is not a substance itself. In a sense this is self-explanatory, since the bodies of creatures and vegetation are endowed with immense complexity of function and organisation, in which respect they go much beyond the relatively simple definition of a corporeal substance. The purpose of drawing attention to this is, primarily, that Leibniz has his moments of descriptive sloppiness and sometimes forgets what he wrote earlier or assumes without mentioning anything that his reader is acquainted with his earlier writings. Accordingly one can, here and there, find statements from his pen which convey the notion that corporeal substance can be understood as body in the sense of ‘animal/plant body’. Such ambiguities must, unfortunately, be taken on board and dissected as appropriate to the context in which we find them.}
I distinguish therefore

1. the primitive Entelechy or Soul,
2. Matter, i.e. primary matter or primitive passive power,
3. the Monad completed by these two,
4. the Mass or Secondary Matter, or organic machine, for which countless subordinate monads come together,
5. the Animal or corporeal substance, which is made One by the monad dominating the machine.

Despite the footnoted disclaimers on several details, this outline has the virtue of depicting the compartmentalisation as well as the hierarchical structure pertaining to monads and aggregates, in respect of which embodiment is the indispensable criterion of every monad. Moreover, its body, consistent with the overall monadic theory, is intrinsically indestructible, but it may of course lose its principle of animation as a result of the collapse of co-operative functionality – its organisation as an entity. But in life this body, in virtue of the activity of its dominant monad, is an entity per se.

At this point the picture complicates itself. If the above five-fold structure must be criticised on at least two counts of flatly self-contradictory statements, there are nevertheless utterances in some of Leibniz’s later writings where he seems to be willing to take the sting out of the contradiction of Point 5 by, as it were, retroactively confirming it – where in fact he departs from his earlier stand and articulates a composite-substance ideology:

A substance is either simple, like a soul, which has no parts, or composite like an animal, which is constituted of a soul and an organic body.

[There are] no complete substances without extension … souls or forms without bodies would be something incomplete, inasmuch as, in my opinion, the soul is never without an animal or some analogue.

Now this is a very strange turn for several reasons. Scholars who are convinced of Leibniz’s ultimately idealistic frame of mind take their bearings mostly from the writings of the new century, or at least from the post-New System vintage, when Leibniz’s interest in physics was apparently waning. But it seems hardly a compelling argument that Leibniz tore down the rafters of his physics to construct for himself an idealistic

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35 Adams (op. cit., p. 265) writes on this: “It is striking that the ‘soul’ is not identified here with the monad, but with an aspect of it, and is presumably not a substance that can be considered as an entity only by abstraction from a complete substance or monad.” As we shall see in due course, Adams is labouring under a misunderstanding here – with which however Leibniz himself also confused de Volder – about the meaning of ‘soul’. For Leibniz entelechy is a “kind of soul”, but never the soul of a living animal.

36 One cannot help wondering why Leibniz included primary matter in this tabulation. It must have come as a considerable irritation to de Volder, whose orientation was a mildly disenchanted Cartesianism. But though on the lookout for something better, his exchanges with Leibniz brought neither side the desired satisfaction – on Leibniz’s side, one suspects, because he was too much embroiled with pre-established harmony and not fully alert to the genuine needs of his interlocutor. For a fine short account of the correspondence, see Paul Lodge, “Leibniz’s Close Encounter with Cartesianism in the Correspondence with de Volder”, in Paul Lodge (ed.): Leibniz and his Correspondents, Cambridge University Press 2004, pp. 162-92.

37 We heard just a moment ago that an animal body is not ipso facto a corporeal substance!

38 De Volder, G II 252ff, L530f.


40 Met. Con., Cr I 11-16, P 174-5.

41 Masham, G III 357, quoted by Adams, op. cit., p. 270.
scaffolding: if anything, it is more probable that by this time, with a comprehensive treatise on Dynamics under his belt, he had little more original work to contribute and was content with what he had achieved. Otherwise we would have a problem on our hands how to account for the above passages, dating from 1712 and 1715, with their decidedly pro-physics profile. For plainly, if body is substance, then it can only be physical substance; and an animal is a decidedly physical existent. Adams points out, in further support of this view (which nonetheless he opposes!), that Leibniz became increasingly pre-occupied with “the distinction between complete and incomplete substances” and even reverted to notions derived from Suarez, albeit modified in accordance with their ‘correct’ interpretation according to Leibniz. One such passage reads:

The opinion of the School, that the soul and matter are incomplete in a way, is not so absurd as is thought. For matter without souls and forms or entelechies is only passive, and souls without matter are only active, since the complete corporeal substance, truly one, which the Schools call one per se (as opposed to a being by aggregation) must result from the principle of unity which is active and the mass which makes the multitude and which would be purely passive if it contained only primary matter.

All this seems to propel us straight into the double-aspect theory which is still waiting in the wings. Yet a difficulty remaining with us for the moment is that no clear reason is articulated by Leibniz for changing his mind in favour of composite substances. Donald Rutherford has endeavoured to fill in this lacuna in Leibniz’s self-advertisements; let us see where it leads us.

“In 1686,” he writes, “Leibniz’s primary metaphysical commitments clearly pointed in the direction of denying that bodies as conceived by Descartes are anything real at all. Yet if for no other reason than that he was bound to orthodoxy, this conclusion did not fully satisfy him. Religious doctrine and common sense both dictated that human beings are embodied substances.” This strikes us as a conspicuously weak argument. For although we might agree that Descartes did not succeed in clarifying the nature of body with his doctrines, it is not true that this must lead to a denial of the existence of bodies, either by Descartes or Leibniz. As for the latter, it can scarcely be upheld that Leibniz was driven by fear of censure from common sense or orthodoxy to affirm the existence of bodies! Rather it is the case that “the design of Leibniz’s metaphysics always begins with the argument that, as there are bodies, there must be forces”, which is confirmed by the fact of Leibniz’s discovery of force as his grounding principle from the existence of certain properties of bodies. It is true, however, that the explanatory scheme relating to ‘body’ differs according as we address the

42 Dynamics de Potentia et Legibus Naturae corporae, written c. 1691 and intended for publication, which never eventuated. The work was ultimately incorporated into GM VI 281-514.
45 Rutherford, op. cit., p. 155.
46 Indeed, Descartes writes explicitly in the Sixth Meditation (AT VII 80, CSM II 55): “It follows that corporeal things exist. They may not at all exist in a way that exactly corresponds with my sensory grasp of them, … but indeed everything we clearly and distinctly understand is in them.”
48 The reader may recall from the Preamble, supra, the fundamental point that for Leibniz the works of the Creator “are on exhibit for us to admire”; and how he sees this as a realistic criterion of his metaphysics forms part of our analysis of his phenomenotaxis in Sect. B, §5 hereunder.
concept in monadic terms (where it answers to passive force) or in physics terms (where phenomenal categories and mathematical laws apply).

Accordingly the best that can be said for Rutherford’s opinion is this: that the principal difficulty of the doctrine of composite substance is precisely that it demands an account of soul and body fused in a single entity, and it is easy to see that it entails the contrary to Leibniz’s usual reductive analysis – instead of down from bodies to simple substances, up from a metaphysical point to a physical mass and from an intrinsic unity to an infinitely large collective. Yet it is surely asking too much to see in this turnabout an aberration on Leibniz’s part. Even in his supposedly idealist manifesto, the Discourse, Leibniz found a moment for “assuming that the bodies that make up an unum per se, as does man, are substances…”50, while in the Arnauld Correspondence he affirms this by noting that “our body in itself, leaving the soul aside (i.e. the corpse) can be called a substance only by an abuse, like a machine or a heap of stones…”50 In other words, one must distinguish between an ensouled body and a body by accident, the latter being what all bodies not enlivened by a soul amount to.

9. De Volder and Bernoulli substances

The discrepancies noted above have, however, recently been resolved in a very neat exposition by Pauline Phemister with her distinction between De Volder substances and Bernoulli substances.51 It transpires that Leibniz describes two principal types of corporeal substances in his writings, depending on the identity of the recipient. To counter the dissatisfaction with the de Volder monads, Phemister quotes a description offered by Leibniz to Bernoulli. It is not articulated in as much detail as de Volder receives, but it gives us more leeway to dovetail it with numerous similar expressions from his pen:

What I call a complete monad or individual substance [substantia singularis] is not so much the soul as it is the animal itself, or something analogous to it, endowed with a soul or form and an organic body.52

In the same year Leibniz gave a substantially similar rendering of his thoughts on the matter to the journal Acta Eruditorum, which leaves us with no doubts whatever that for Leibniz entelechy and body are not two things, but one – or, differently put: they do not form an aggregate, but a unity and must therefore be regarded as true existents:

A first entelechy must be found in a corporeal substance, a first subject of activity, namely a primitive motive force which, added over and above extension (or that which is merely geometrical), and over and above bulk (or that which is merely material), always acts but is yet modified in various ways in the collisions of bodies through conatus and impetus. And this substantial principle itself is what is called the soul in living things and the substantial form in other things.53

This, then, is the description which answers to the name Bernoulli monad. We note at once that we are, so to speak, back at the beginning, i.e. with Leibniz’s original cri-

49 Disc. Met. §34.
50 Arnauld, LA/G 73.
52 Bernoulli, Sept. 1698, GM III 542, AG 168.
tique of Descartes’ faulty notion of the genesis of motion. Leibniz has no mind to deny the reality of matter, providing it is properly understood in what this matter consists – namely an entelechy as the ‘driving motor’ of its own affiliated body. Moreover it is a clear implication of the description that no entelechy can exist on its own without body; nor conversely that matter may be said to have existence unless it possesses substantial form.54

We can see that this is both a simpler and more coherent argument than the vacillations Leibniz offered to de Volder; and as always in such cases, one wonders what stopped Leibniz from coming out with a clear prose statement to this correspondent of which he was so eminently capable!

It is of considerable importance now to keep these distinctions uppermost in mind – and especially so in view of the fact that the scholarly literature is accustomed to holding up the de Volder monad as Leibniz’s model case while ignoring the Bernoulli model.55 Therefore it is worthwhile adding another Bernoulli letter to the fray where Leibniz spells out its ontological status:

By monad I understand a substance truly one, namely, one which is not an aggregate of substances. Matter in itself, or bulk, which you can call primary matter, is not a substance; indeed it is not an aggregate of substances, but something incomplete. Secondary matter, or mass, is not a substance, but [a collection of] substances …56

What is intriguing in this contredance between Leibniz, Bernoulli and de Volder57 is the fact that by now Leibniz had acquired notoriety as the author of pre-established harmony. This theory plays hardly a role among the trio; yet Leibniz thought to have tackled with it the one serious Cartesian issue that was still left unresolved and proudly put it into the very title of the paper entrusted to the Journal des Savants of 1695: New System of the Nature and Communication of Substances and of the Union of the Soul and the Body.

10. Pre-established harmony

He articulates the principal thesis as follows:

The organised mass, in which the point of view of the soul lies, being expressed more clearly by the soul, is in turn ready to act by itself, following the laws of the corporeal machine, at the moment when the soul wills it to act, without the one disturbing the laws of the other. … It is this mutual relation, regulated in advance in each substance of the universe, which produces what we call their communication, and which alone constitutes the union of soul and body.58

Despite its deterministic overtones, this passage fits comfortably into the double-aspect ontology to be articulated later, but must be anticipated in a few brief words to prevent a ready-to-hand criticism that has been levelled at Leibniz for, as it transpires, reasons other than the coherence of his pre-established harmony. It is this: that each monad by its individual law of the series — the series of events which unfold as its individual career — is “naturally fitted” to consort with monads whose law of the se-

54 Further discussion and eventually a structural schema of the Bernoulli monad will be offered in Part II.
56 Bernoulli, GM III 537, AG 167 [italics added].
57 It was Bernoulli who had recommended Leibniz to de Volder and then asked Leibniz to correspond with de Volder. Meanwhile occasional ‘progress reports’ continued between Bernoulli and de Volder as well as Leibniz and Bernoulli.
58 NS, I. 123.
ries produce harmonious relationships. It is not quite the case that ‘birds of a feather flock together’, but in its rough and ready way the adage suggests something of the kind. The monads of an organic machine comprise such an organic unity precisely by reason of their co-operative effort, and whether they will it or not, their destinies are interlocked on account of having found their place as members of this co-operative. Accordingly it is unnecessary for the soul, when it wills to act, to bully those members around, which is indeed impossible. It simply expresses, in this act of willing and in virtue of its high degree of perceptive sensitivity, the state and trend of the entire conglomerate.

The need for bringing this up at the present moment is revealed in Leibniz’s troubles with making his conception stick with his contemporaries, as testified by his interminable efforts to meet critics’ demands for ever more refined explanations over a space of 15 years, from Bayle to Tournemine. Moreover the pre-established harmony remains remarkably unmentioned in the *Monadology*. On this account there has been a minority consensus of opinion among scholars that Leibniz pulled a rabbit out of the hat with this idea — an issue first raised by Feuerbach in his 1840 study of the philosopher. Is it the case, however, that there must be a fire where so much smoke is wafting into the air?

The most important testimony, that of his French admirer Simon Foucher, offers a clue to what is wrong with the theory. Bluntly spoken: not with the theory itself, but the language in which it is couched, which is entirely embedded in the presuppositions of the Cartesian dual-substance doctrine. For Leibniz this must have seemed an advisable expedient, seeing that its place of publication was Paris, the very nub of Cartesianism. Perhaps Leibniz intended the *New System* as a ‘soft’ entry into his doctrines and hoped to divulge the nitty-gritty step by step thereafter; and it is this attitude which incurred for him the bitter recriminations of Foucher.

Foucher’s accusations amount to a charge of cowardice, as can be seen from the quote in the footnote. And indeed, we who are fortunate to have access to Leibniz’s autographs can see at once the discrepancies in articulation between the accounts. Leibniz must have feared rejection and even ridicule for his initial draft with its hints of scholastic survivals, and so we see him padding it out with increasing Cartesianisms

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59 A somewhat far-fetched though interesting comparison may be permitted here, which recurs in this thesis at a later stage (see p. 158): but if we think of the neurons in the brain as such a conglomerate, it can be said that their physical activities may at some point result in ‘desire’, ‘anger’, ‘sleepiness’ etc. as the momentary content of the mind and be expressed by the mind in a suitable way. In this sense, then, the mind/soul may be said to ‘in communication’ with these parts of the body and express their activity in mind-like form. The whole body may react in turn with some form of muscular activity; and then the question would occur: was it the mind which gave the command or did the muscles act in response to the state of the neurons? Obviously this question does not permit of a definitive answer, but it reflects to some extent the relational nature of all bodily activity and of the relation of the mind to this as the organ of its expression.


61 Foucher (12 Sept. 1695) made it clear to Leibniz that among those of his followers to whom he had already confided the essence of his thinking, the published *New System* was an evasion of the real issues. “What could be the point of this great contrivance?” he asks, and goes on to note that “it seems to me that this system is hardly any better than that of the Cartesians.” Although Leibniz jumped to a startled defence of himself, he received no further communication since, regrettably, Foucher died shortly thereafter. Cf. Woolhouse & Franck, Leibniz’s *New System* and Associated Texts, Oxford 1997, pp. 41-4.
over the next two drafts. In the end, the ‘authentic doctrine’ (i.e. first draft) never saw the light of day; and this left us for some 250 years with the unsatisfactory state of affairs of nearly all printings of the New System giving only the confusing Parisian account, which requires more interpretation and offers more pitfalls to the student than are necessary for understanding it.

The crisis for the New System (‘Paris Style’) finally occurred in 1708, in his exchanges with Tournemine and Des Bosses, who charged Leibniz to explain the bond between body and mind. But by then, Leibniz seems to have abandoned all hope of satisfactorily explaining these matters and assented half-heartedly to a (miraculous) vinculum substantiale in which he never believed.62

11. Résumé and transition

Leibniz’s conception of substance, although it draws on certain features of Aristotelian and scholastic philosophy, rests on an understanding of existence which differs in all crucial respects from that of his predecessors. Most notably it collapsed a whole array of static features (essence, haecceity, substrate etc.) into a single primitive but dynamic element (later called a ‘monad’) which is multiplied in sum-of-predicates individuality across the infinity of the cosmos. Existence is thus grounded in force, the sole premise of actuality. Although this implies, as one would expect in the 17th century, a special creative act on God’s part – force being all-pervasive, all monads are created at once – it is peculiar to Leibniz’s ontology that the logical correlations proposed for his substances bring radically unorthodox conclusions in their train. For example, it is a consequence of his specifications that God did not create the world (‘world’ here being understood as the cosmos with all its furniture, laws and principles): He created monads and laws pertaining to their harmonious concourse, nothing further being required to determine the evolution of the universe. (It may have been fortunate for Leibniz that none of his many epistolatory partners put this question to him!).63

Given this initial presupposition, however, there arises the difficulty on which this chapter has turned so far. The difficulty is the two-fold dilemma of accounting for unity-in-plurality and for the extension of body. Simple substances lack extension; yet the existence of extended body is a cardinal ingredient of the project and directly involved with his inquest into the measure of security conferred on it by being grounded in force. But priority belongs to the vexing dilemma of how a consortium of substances acquires the unity to permit of its definition as substantially one. Gerd Buchdahl put this case as follows:

As Leibniz poses the question, it is: What makes any plurality a unity? And what is the logical status of this unity? His answer is that the relations between the parts of an aggregate are purely ideal, or ‘imaginary’, in the sense of being ‘mind-dependent’. Two separate things do not become one however much they may be cemented together by physical ties. It is true that there are composites which constitutes in some sense a unity to varying degrees, depending upon whether they have more or less mutual connections, … but the relations involved in so far as they give us anything ‘real’ depend ‘simply on the mode of being of the’ constituents. … This ideal status of the connections is

63 This issue is further elaborated in Part II.
therefore a further strand in the account which considers complex physical things, and any aggregates in general, ‘mere beings of reason’ or of ‘the imagination or perception, that is to say phenomena’.

As excellently as the dilemma is described here, its solution leaves much to be desired. Its insistence on the mind’s constitutive role begs the question on both logical and metaphysical counts; for once it is conceded that its power of imposing relations works beneficially in respect of corporeal substances (the dominant monad concept), then ipso facto the argument permits its own extrapolation upon any corporeal aggregate whatever. But this is not the way the situation holds in Leibniz’s descriptions: some monads are bearers of the inertial principle and this is the logical hinge on which differentiation is fixed. As Buchdahl depicts them, however, the connections established by ‘dominance’ must be accounted as ‘mere beings of reason’; but with this conclusion we return to Descartes’ court with nothing changed. Then it was an unnecessary complication to redefine the res extensa as force, while bodily existence remains a figment.

But Leibniz never set course on demolishing physical reality; rather his philosophy is one great effort to explain it. Hence (inter alia) his lifelong desire to hang on to the substantality of human bodies through the concept of corporeal substance. Thus, in a letter of 2 June 1679 he asked Malebranche to explain to him a series of six propositions traded in Cartesian metaphysics, of which one was, “how can the spirit subsist without being bonded to a body?” In his letter of 14 July 1686 he confessed to Arnauld that “however much I agree with the scholastics in this general and so to speak metaphysical explanation of the principle of bodies, I am as corpuscular as one can be in the explanation of particular phenomena, and it is saying nothing to allege that they have forms or qualities.”

In one of his ‘Labyrinth’ essays we read: “There are as many souls as there are substantial atoms or corporeal substances.” Finally, on the basic issue of grounding phenomena without leaning on transcendental existents, we have his own words from the celebrated passage in the New System:

I had travelled far into the world of the scholastics when mathematics and modern writers lured me out again, while still a young man. I was charmed with their beautiful ways of explaining nature mechanically, and scorned with justice the method of those who only make use of forms and faculties, from which we learn nothing. But later, when I tried to get to the bottom of the actual principles of mechanics in order to give an explanation of the laws of nature which are known through experience, I became aware of the consideration that an extended mass is not of itself enough, and that use must also be made of the notion of force, which is fully intelligible, although it falls within the domain of metaphysics. It seemed to me also that the opinion of those who transform or degrade the lower animals into mere machines, although it seems possible, is improbable, and even against the order of things.

We can discern in this his opposition to a notion of reality which results in the impoverishment of phenomenal reality. It questions the validity of a concept of the world which effectively absorbs it into the agent of cognisance and thereby dismantles it. This is a persistent refrain in Leibniz’s writings, his basic agenda being nothing

65 Malebranche, G I 334. All six of the questions are ‘rhetorical’ in the sense that Leibniz wishes to convey the impression that the propositions being questioned are evidently false.
66 Arnauld, LA/G 58.
67 Wonders, A iv 279, LeC 263.
68 NS, P 116.
other than to restore that unity through a recognition of the unity of nature, in which metaphysical principles serve in large part to legitimise belief in a real and coherent physical existence.

Thus the question whether this agenda was tacitly abandoned in the twilight of Leibniz’s career is more than an academic debating point. The text of the Monadology suggests he did, as R. C. Sleigh writes, “all bodies, corporeal substances included, are phenomenal in the ontologically weighty sense that truths about them must supervene on facts concerning the properties of the monads.” But if this conclusion is taken in all seriousness, then we are indeed undermining the unity of nature which is the cardinal hinge of Leibniz’s mature philosophy. For in the reduction of nature to monads, nature is altogether lost – it becomes an omnilateral illusion, an inner picture show where every fact and event is mere appearance and sentition has no correlate in things being sensed. Where this must be seen to fail, however, is in the impossibility of giving a reason why God should devise such a whimsy and why we should call it a cosmos; and it is because of the insufficiency of any possible reason for this supposition that Leibniz never produces one. On the plus side of the argument we find merely one consideration, and this can be resolved easily enough: namely, that nature is not the monads, but that monads build up what we call nature. Sufficient reason can indeed be given for this last-named scenario, and Leibniz is not sparing with examples in the Monadology; but although he refrains from connecting it to his physics, this is a case where absence of evidence is not the same as evidence of absence.

And this brings us to an important issue which demands a brief digression. How important is the Monadology, really? It seems this question has not been asked before; yet it is of crucial importance to confront it – for this reason: When we speak of ‘The Philosophy of Leibniz’, we have surely some body of work in mind – a construct of great intelligence and coherence, laid down in a vast corpus of work covering many branches of thought and stretching over a length of 50 years of the thinker’s life. Now to pluck one short work out of this corpus, a mere pièce d’occasion with fairly restricted scope and hold it up as ‘The Philosophy of Leibniz’ must already strike one as an unconsconscionable exaggeration. But if now we add that it was written specifically for two individuals whose interest in Leibniz’s philosophy was as readers of his Theodicy, our misgiving as to its fitness to completely represent ‘The Philosophy of Leibniz’ ought to increase further.

But it is chiefly from the point of view of its contents that suspicions cling to the work. The intended readers being interested in Leibniz’s religious thinking, explains very adequately its idealistic trend; but more pertinent to objective scholarship are (as Richard Kennington writes) “the silences of the work as compared with other writings that treat of substance”:

The Monadology never mentions force, except once in passing towards the end [§80]; hence it in no way suggests that the monad has anything to do with force. It never mentions form; therefore it does not speak of the monad as a union of form, that is, primitive active force, and prime matter, that is, primitive passive force … [which] would be repugnant to its treatment of the monad as a separate soul substance …

In a word, the text exhibits what Kennington refers to as Leibniz’s ‘prudential Cartesianism’ – his concessions to readers whom he had no reason to trust with an

69 Sleigh, op. cit., p.100.
understanding of the fruits of his own fundamentally anti-Cartesian thinking. And it is meanwhile adequately known that the several drafts ring important changes on terms or notions which denote his own meanings in favour of a conventionally ‘familiar’ aspect. Thus, to mention just one more instance of watering down, the *Monadology* relates the plurality of monads to the plurality of ideas in God’s mind. But the *Radical Origenation* has ‘essences’ instead of ‘ideas’; and these clearly do not represent the same notion. Leibniz accordingly writes that

> there is in possible things, that is, in possibility or essence, a certain exigent need of existence and, so to speak, some claim to existence; in a word, essence of itself tends towards existence.\(^{71}\)

But could he trust theologically alert readers (especially catholics) to understand the fine print in this? Evidently Leibniz did not think so; and he obviously did not have the scholar of the future in mind who might interpret this ambiguity as a confusion in the mind of the philosopher?\(^{72}\)

However, the crucial point is that the final version of the *Monadology* exhibits a kind of thinking which sounds improbable when set against not only his other writings, but even the earlier manuscripts. Here he almost paints himself into a corner on the status of the physical world – namely, that in such a rigorous reduction he inadvertently slips into an *interface catastrophe* with strong resemblance to the Cartesian dilemma which his whole philosophy was designed to overcome. Buchdahl recognised this when he wrote: “The crucial problem is whether such a narrowly conceived model of reality, viz. mind, can make contact with the world of physical relationships.”\(^{73}\) Had Buchdahl not been misled by academic tradition to accept the *Monadology* as Leibniz’s *chef d’oeuvre*, his verdict would have been different.\(^{74}\)

We return to our beginnings. With Aristotle there was never a doubt that the physical world is real. Leibniz concurs; and far from seeing in his metaphysics an apoee of idealism, we find *nature* given its due place: “I believe rather that everything is full of animate bodies … one cannot fix on a part of matter so small that there are no animate bodies within … there is naturally no soul without an animate body.”\(^{75}\) This criterion that soul and body are a unity *ab origine* Leibniz never departed from. As H. H. Holz points out, ‘we ‘have’ that body before we become aware of so-similar operations, for the latter can only refer to what is of the body … [but] contrary to the impression that this upholds merely a two-substance doctrine modified by the compositionality of the two substances, it transpires that the concomitance between soul and

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71 Rad. Orig., P 137.
72 It is indeed the case that a reader of the literature on Leibniz must become immured to the constant drone of supposed ‘confusions’ by Leibniz. If everyone of these accusations were correct, the probability of Leibniz having a coherent notion on any of the subjects he wrote about reduces to almost insignificant scope. But should we not wonder, then, how this can be reconciled with the title of a ‘great’ philosopher to which Leibniz is nonetheless universally held to be entitled?
73 Buchdahl, op. cit., p. 414.
74 The reader who may wish to doubt that Leibniz deliberately laundered his text to accommodate philosophical amateurs need only consult the *Des Bosses correspondence*, which is contemporary with the *Monadology* and look, for example, at the passage quoted in §7 (g) hereunder for plain evidence of how Leibniz’s addressed a man thoroughly versed in philosophy.
body is brought about by the soul expressing the body as its form.”\textsuperscript{76} Which is indeed a claim endorsed in Leibniz’s own words.

Whether (as Holz maintains in his objections to the widespread attribution of idealism or spiritualism to Leibniz) this leads to a primarily materialistic conception is perhaps debatable. The question is only whether Leibniz ever distanced himself from it. The indications are that he did not; that on the contrary his whole philosophical effort was devoted to grounding it in unimpeachably valid metaphysical principles. In the end, writes H. Rombach, “one cannot reach an understanding of Leibniz’s natural philosophy by assuming it to be derived from his metaphysics; rather, it is the other way around. But Leibniz’s metaphysics has always been pushed to the forefront (depriving it of its inner necessity), and it has even been portrayed exclusively as ‘his philosophy’, leading to distortions and misconstruals. How could one possibly suppose … that his scientific thinking (e.g. combinatorics [or the calculus—ed.]) would not exert the most decisive influence on his metaphysics?”\textsuperscript{77}

This explains the primordiality of force, which is correctly understood only if we recognise in it both a reduction of matter to its primitive state and the matching possibility of constituting matter from force – physics and metaphysics interlocked. Thus, when Arnauld claimed that God could reduce a body to perfect rest, Leibniz replied, “my answer is … that if ever God reduces a certain body to perfect rest, which can be performed only by a miracle, a new miracle will be necessary to restore some movement to it.” The one thing Leibniz could not countenance was the attribution of illogical behaviour to God. If God is rationality supreme, then his cosmos must be. And then no reason can be given for him to wish to disturb the rational perfection of his creation: therefore he will not perform the miracles which in our naivety we assume to be ‘necessary’ from time to time.

We seem to have covered a fair stretch of ground; but as one great master of his art once said to his impetuous pupil: “If you want to be a master, you can’t break the rules until you know what they are.”\textsuperscript{78} So there was purpose aforethought in this detailed survey of Leibniz’s adoption of ‘obsolete’ intellectual resources. These were the rules of the masters from whom he learnt the truths it was necessary to know before he could show the world a truth it had not known before. Two features command our particular notice:

(1) that Aristotelianism represents a clear-cut case of presuming the existence of a physical world and of living bodies in it; of taking these data as given and therefore subjects of philosophical investigation. As our several strategically placed citations served to show, this is precisely the starting point for Leibniz’s physics, which therefore elicits a ‘higher or metaphysical’ contemplation of its criteria – to date all concerned with basic matters such as substance, substantial form, corporeal substance, matter and phenomena.

\textsuperscript{76} Holz, op. cit, p. 363. Cf. Fischer, Note 51!
\textsuperscript{78} Haydn to Beethoven.
(2) These initial criteria represent the scaffolding on which Leibniz erects his whole ample ontology. This, as we have claimed, rests on a double aspect theory of reality; and the time has come now for us to turn our attention in that direction.

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B) DOUBLE-ASPECT THEORY

1. Interpretive aporias

The thesis being developed in this chapter is that Leibniz’s ontology amounts to a double-aspect theory of reality. If this holds, then the mainstream interpretation of Leibniz as a member of either the idealists’ or phenomenalists’ league will have to give. There is, of course, a long and strong tradition behind both these interpretive traditions, the former dating back to the pioneering study of Ludwig Feuerbach, the latter being inaugurated in the post-Kantian schools of Hermann Cohen and Ernst Cassirer.79 One important issue under contention in this study is, as mentioned, that the Monadology serves most scholarship as the definitive statement of Leibniz’s philosophy and is seen as casting its shadow back over Leibniz’s prior writings, as if they were all part of a groping towards the position finally expressed in it. That position seems indeed to encourage idealistic or phenomenalistic readings, but we shall see that this is by no means as transparent as usually assumed.

By the same token, there is widespread acknowledgement in the literature that Leibniz worked on natural philosophy and metaphysics hand in hand, even that the stress given to an exclusively idealist/phenomenalist reading is untenable in the elaboration of an encompassing picture of Leibniz’s philosophy. How to account for this manifest discrepancy is not a necessary agenda item for us, although we must return to it at one or two crucial junctures later in the piece. It is necessary, on the contrary, to articulate in which respect a double aspect theory may serve us to achieve a goal that is denied to interpretations solely guided by idealist or phenomenalist readings.

It seems a thin line of difference when the cumulative impact of Leibniz’s writings is evaluated; yet from the words of an old adage, “for want of a nail,” we may extract the meaning that not the most imposing edifice is immune to collapse if its smallest parts fail to play their role in sustaining it: and now idealism and phenomenalism, retreating each in their own way into the mind to explain the physical world, do so on the back of one unexamined assumption which, when it is closely examined, fails signal ly to stand up to the test. This is the assumption that when one has explained the fundamentals, one has explained everything; and this conduces to the false belief that basic laws and principles will ineluctably filter upwards through all strata of further explanation until we reach the phenomenal level. Where it is seen to fail, however, is in the fact that phenomena have their own integrated and irreducible subset of laws, and the penalty of reducing these is the loss of the very criteria to which those phenomena owe their existence. In other words, there are laws and criteria which exist only in the phenomenal domain and for which one searches in vain among lower strata of explanation. It might seem

79 Feuerbach, op. cit.; Ernst Cassirer: Leibniz’ System in seinen wissenschaftlichen Grundlagen (1902), Georg Olms Verlagsbuchhandlung, Hildesheim 1962.
scurrilous to insist that this points to an irrefragable autarky; but unless it is granted, the structure of the phenomenal world is going to look like a quilt quotation from God’s works rather than a coherent, rational whole.

That Leibniz was fully cognisant of this consistency of the appearing world is rather more easily proved than the converse, as will come out of the ensuing discussion. But a very obvious example of this is the phenomenon of life itself, which will serve excellently in illustration of the aporias to be dealt with. It may be put this way:

Under the materialistic presuppositions governing our present scientific world image, life is assumed to arise from specific congregations of matter as an ‘emergent property’; but the manner is which this supposed property emerges remains an enigma and the theory is therefore a mere proposition – a take it or leave it assertion. For the manner in which science could arrive at such a demonstration is not available, since (a) going the reductionist way of decomposing a living structure is to kill the object. But a corpse lacks life and cannot therefore yield the desired knowledge. This is because (b) a living body is not a machine that can be dismantled and reconstructed in every detail; for this to be possible science would have to be in prior possession of a complete theory of assembly, which is however the thing it seeks to discover. Finally (c) every reductive exercise on living things arrives eventually at a point where the phenomenon ‘life’ cuts out, even while the research is still anchored in the phenomenal domain.

In relation to phenomena which do not manifest themselves outside of the phenomenal world and are thus irreducible, there is a splendid exhibit in Leibniz’s Tentamen anagogicum which may serve here in illustration, as a further and highly specific case study to those more general specimens already alluded to.

The ‘object’ in question is a beam of light being forced to make a ‘choice’ among many eligible (and by no means readily intuitive) pathways to which the celebrated principle of ‘least action’ applies. Leibniz writes:

> It can be shown that [the laws of motion] originate in the wisdom of their author or in the principle of greatest perfection which has led to their choice … The most beautiful thing about this view seems to me that the principle of perfection is not limited to the general, but descends also to the particulars of things and phenomena.80

Leibniz points out that the problem of possible pathways of reflected light, for which the general formula is \( \pm 2 \), has two mirror-like solutions. This is equivalent to stating that every point (except one) of incidence on the surface has a symmetrical match on that plane: see illustration below.81 Adumbrating this, suppose the rectangle to be a sheet of paper that can be folded along one diagonal: now all points on one of the resulting triangles correspond symmetrically to a point on the other triangle. Fold the sheet again on the hypotenuse to ascertain the point correspondences on the fold. The demonstration then boils down to showing that the centre point derived from folding the sheet on both its diagonals represents the one locus on the plane which lacks a symmetrical counterpart. The issue then turns on the (metaphysical) conundrum of why and how a beam of light ‘finds’ this one point.

80 Tent. Anag., L 478.
81 From George Gale: “Leibniz on Metaphysical Perfection, Physical Optimality and Method in Physics; or, a real tour de force”, presented to The North American Leibniz Society, Chicago 2002, p. 10. Copy of the paper kindly supplied by the author.
The ‘why’ of this is plausibly answered by recourse to the principle of sufficient reason. Since all solutions except one, Leibniz states, are ‘equipollent’, this means that no sufficient reason can be given why the beam should choose one pathway in preference to another. Accordingly Leibniz asserts that there must be a unique solution, i.e. the one which is maximally determined.

Now on the traditional notion of the conservation of vis viva, this maximally determined pathway can be none other than the path by which the light would expend least energy; so if this idea holds up, we find ourselves in the presence of what is referred to as Leibniz’s ‘minimax’ principle, i.e. maximal perfection conjoint to minimal action. An edge-on view of the problem serves to show the correlation to ‘expended time’ in these alternative solutions:

In this illustration, a graduated time scale is correlated to the various angles of reflection and shows at once that only one point (ideally not physically) on the plane serves the minimax principle. The reader may now wish to compare Leibniz’s account of the cause (i.e. sufficient reason) with Feynman’s, who writes that the duplicate paths simply cancel each other out and the remaining least action path is indeed the unique principal axis.

83 It would lead us too far into quantum physics to pursue the rationale for this; but Feynman confirms that experimental evidence shows that ‘in fact’ reflection occurs all over the mirror surface, which accounts for strange reflection phenomena in the case of so-called ‘refraction gratings’, which are mirrors with parts of their surface scraped off; op. cit., pp. 45ff.
84 The law described above is historically associated with Maupertuis and dated 1744. The question arises therefore why Leibniz’s principle seems thus unceremoniously to be subjoined to Maupertius’ ‘intellectual property’. Marta Fehér, “Vom Prinzip des einfachsten Weges bis zum
In the same paper Leibniz gives a further illustration, known as the ‘brachistochrone’ to amplify his point. A brachistochrone is a curve between two points that gives the shortest path in time for a body which has several eligible options for this movement. It is not intuitively obvious even to a scientific mind which of many similar curves is the shortest; but physical bodies moving entirely without free will seem always to ‘find’ it, just as the path of light in the least action example does. Moreover, Leibniz writes,

in these forms or figures the optimum is found not only in the whole but also in each part, and it would not even suffice in the whole without this. For example, if in the case of the curve of shortest descent between two given points we chose any two points in this curve at will, the part of the line intercepted between them is also necessarily the line of shortest descent with regard to them. It is in this way that the smallest parts of the universe are ruled in accordance with the order of greatest perfection; otherwise the whole would not be so ruled.\(^5\)

Since Leibniz has already identified in this passage the principles which rule here, it is not necessary to highlight them separately; but it should also be noticed that one of them recurs in our section on continuum studies, namely scale invariance. It means that the truth of the principle will manifest itself on any scale of magnification. Necessarily, therefore, it must be a law imposed by God on the cosmos, irrespective of the scale of its operation. George Gale draws the metaphysical and scientific consequences:

Perfection, as a metaphysical property, is a function of the perception of monadic substances, described in the form of a ratio. Perfection, as a physical property, as an optimal property, is a function of physical systems at all scales, described by the mathematics of optimal forms. The demand that Leibniz puts upon his notion of perfection […] is severe; yet the figure that he finds, the brachistochrone […] like metaphysical perfection, exhibits the form of a sort of optimising proportion: what is the path of quickest/shortest descent with respect to gravitational force? From the methodological point of view, this property is to be discovered and described by the method of optimal forms, an application of the calculus of variations.\(^6\)

The interest to us of this interlude is that the arch-epitome of phenomenality, light, is involved. Yet, as Gale’s description affirms, perfection is not an achievement reserved to substances – it appears that God is not squeamish in respect of endowing phenomena with principles of action which exemplify a perfection that is at least uncommon in the realm of phenomena. Yet more importantly, it is the physicist who is speaking here. It cannot be an order simply perceived and interpreted by a mind which observes it and so to speak extracts its phenomenal reality – this is a real, physical and independently existing phenomenon.

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\(^{5}\) Prinzip der kleinsten Wirkung", in *Studia Leibnitiana Supplementa* XIII (1974), pp. 161-72, notes that Fermat had already given a geometrical formula in 1662. In turn the philosophical principle of greatest economy appeared in the *Recherche de la Verité* of Malebranche (1674). Leibniz’s contribution is identified by Fehér as the effort to “establish a universal determination for the processes of the world and to deliver at the same time the theoretical foundations for empirical laws”. She notes that in Maupertuis’ *Accord de differentes lois de la Nature* the writer succumbed to the identical error in formulation as did Leibniz, which argues for familiarity. She concludes that Maupertuis continued the Fermat-Leibniz line, but leaves it undecided whether historical justice is injured by the suppression of predecessors in the naming of the law.


Gale (2002), §5.
Hence the real point of what we have touched upon is a misplaced confidence in merely presumptive reductionist virtues. To peg these onto Leibniz’s philosophy demands a ‘closed eyes’ perspective again, and thus to miss the very idea that induced him to wear the self-styled title of “philosopher of harmony”. The double aspect theory is one brick in that harmonious edifice. Let us proceed with a statement of its principles.

2. Nature wears no labels

Whichever school of thought we subscribe to in philosophy, in our daily life we must acknowledge without hesitation the real and actual existence of body, because like all creatures we are obliged to navigate among physical objects as through an obstacle course of indubitably tangible and solid impediments. But one may also lay aside the spirit/body disparity and contemplate creation as a continuum in which spirit and body lie in series. We will find this thought occupying centre stage in Leibniz’s continuity studies, but it is equally relevant to the double-aspect context. Those many repeated assertions of his that matter is appearance, phenomenon or aggregate thus do not amount to a denial of the ‘hard’ reality of matter – rather, what he insists on, throughout, is that mind brings intelligible order to bear on it. This is very different from saying that all phenomena are reducible to mind.

Quite the contrary, it says that objects and their properties generally are reduced by the mind to something like itself as a principle of perception; but obviously the mind does not change anything in the phenomena themselves. This is an important, indeed the pivot point, of the whole argument.

The mind’s performance is automatic to such a degree that we hardly ever stop to notice that without it, we would be confronted with a strange and thoroughly bewildering chaos of appearances. For the objects of the world do not come to our cognisance with labels on them; they are not organised ab initio, but require that order to be imposed upon them so as to enable us to live among them without constant risk to our survival. In other words, phenomena exist; the work of the mind is not to create, but to coordinate them. Thus a particular fact may be labelled ‘dune’ by the human mind because to do so is relevant and necessary to our understanding of its features; and the fact that a particular creature (say, a scorpion) aims a body part at us in a certain way may be a relevant sign to us of its intentions. Conversely a fact labelled ‘Capricorn’ to denote a star pattern in the sky shows only an arbitrary order. Finally some phenomenal entities, e.g. ensouled creatures, present themselves as to us as pre-ordered in virtue of being ‘real’, i.e. ens per se, exempting the mind from having to impose order on them.

On the basis of such labelling, Leibniz makes his division of phenomena. If we bear this context in mind, we shall be less prone to lumping all phenomena into the one basket, where clearly many do not belong.

3. Saving phenomena

Philosophically regarded, the change in Leibniz’s philosophy from a two-substance to a ‘worlds within worlds’ conception implies an hierarchical continuum where mind and body each express aspects of the whole. This is compatible with the idea that one of these aspects may possess a greater degree of reality. But there is, in consequence,
an ontology at work which draws both aspects into the one fold. Physical and ideal (mental) are integrated; and this requires of us to accept that features of existence which pertain to one of these ‘worlds’ cannot be subtracted from the other without damaging the whole cloth. This is where idealism confines our options to an untenable philosophical straightjacket, and the same strictures apply to phenomenalism, substance dualism, material monism and indeed most other philosophical ‘isms’. A statement like “all reality is reducible to mental reality” is simply uninformative, indeed meaningless; as is the analogous assertion that “all material reality is reducible to atoms”. Both disregard the crucial factor that in this reduction reality is lost. This is where Leibniz’s double-aspect ontology shows to advantage; for while it ‘reduces’ to an ontology of force or, more specifically, an ontology of agency, this does not impair his cross-linked structure since both aspects filter upwards and downwards through the whole of it. More appositely than of Ptolemy could it be said of him that his metaphysics “saves phenomena”.

As mentioned, many scholars in fact describe Leibniz’s physics-cum-metaphysics as a double-aspect theory without naming it as such. What’s in a name? Perhaps nothing; but names are part of language and therefore determine how and what we think. Hence a nameless theory may shield preconceptions from such a recognition and being influenced against themselves. Nevertheless, the following quotations with their clear and unambiguous message may serve as agenda setting pronouncements:

Daniel Garber:

Throughout his mature writings, Leibniz sides with the mechanists against both the philosophy of the schools and against the Newtonian attempt to extend the mechanical philosophy through the introduction of gravity … This suggests that there are at least two levels in Leibniz’s natural philosophy. At the surface, as it were, is the mechanical philosophy, in which everything is explained in terms of the notions of size, shape and motion, assuming that motion satisfies certain laws. This, I think, is what Leibniz often thought of as physics proper. But below physics proper stands the science that treats of force and the metaphysical entities, the corporeal substances to which force, properly speaking, pertains and from which motion and its laws derive. This science is what Leibniz called dynamics. Leibniz clearly thinks that dynamics is closely linked to metaphysics. … The two levels are difficult to separate completely and treat entirely independently.88

Donald Rutherford:

Although Leibniz assigns a secondary status to sensory knowledge, a significant part of his metaphysics is devoted to the project of reinterpreting the phenomena of our senses such that they become intelligible as the appearance of reality”.89

Richard Westfall:

The science of mechanics in the 17th century stood in intimate relation to the prevailing mechanical philosophy, at once peculiarly concerned with the basic causal processes that the mechanical philosophy admitted in nature, and peculiarly constrained in its de-

velopment by the categories of being that the mechanical philosophy imposed. In Leibniz the relation entered upon a new stage. On the one hand, like every other creative scientist of the late 17th century, he experienced the liberating influence of the mechanical philosophy, an influence in his case which was both profound and permanent. On the other hand, Leibnizian dynamics set its foundation squarely on the repudiation of the mechanical philosophy's ultimate categories of physical thought.90

Gerd Buchdahl:

Although Leibniz makes a very definite distinction between physical and metaphysical levels, it is an important facet of his philosophy that in it physics is decidedly not isolated from metaphysics, and that the relevance of their respective ‘findings’ for each other is assumed … The interesting point is indeed that the influence does not just operate from the side of physics on metaphysics, but also in reverse, for Leibniz’s ‘metaphysical needs’ … in their turn quite evidently did much the dictate the direction of his enquiries into the foundations of physical science, in particular, dynamics.91

The paradox arising from these passages (which are but a sampling of many that could be drawn from diverse sources) is, that from such a beginning, three of their authors still end up abjuring them in favour of a classification of Leibniz as an idealist – in other words, as a philosopher whose doctrine amounts to a claim that reality is a product and/or construct of the mind.92 But there is never a moment’s doubt that for Leibniz a cosmos exists in which mind finds its place and whose phenomena it is charged to order on behalf of corporeal entities required to move among them. The double-aspect theory attributed to him in this thesis argues that idealist interpretations truncate crucial and indispensable portions of his philosophy.

Idealist readings must therefore be regarded as ‘ultimate reality’ theories (positing a metaphysical-only reality), and in them ‘aspect’ functions not as an integrating, but a divisive denominator. Moreover they boil down to methodological statements. They do not inform us what a double-aspect theory entails. This accordingly is the next point to be dealt with.

4. Levels of description

We begin with three criteria: (a) that there are two or more levels of description available to thinkers or researchers in their contemplation of phenomenal existents; (b) that these levels of description do not involve a segregation into disparate and/or incompatible worlds but represent aspects of one world; and (c) that there are degrees of reality involved which also depend on the level of description. Let us now turn to an adumbration of these criteria, although it will be convenient to change the order in which they are to be discussed.

To begin with point (b), if we juxtapose the Cartesian duality with Leibniz’s doctrine of continuity (“nature takes no leaps”), it becomes at once apparent that in the

91 Buchdahl, op. cit., p. 408.
92 I refer to the summary definition of idealism offered in the Introduction, pp. 3-4 supra. An effort has been made not to depart from this definition which seems to be the one most widely embraced in Leibnizian idealist scholarship. For although the whole tenor of debate on idealism itself has changed in the last 50 years, most recent studies by such authors as Adams, Rutherford, Savile, Sleigh et al. remain anchored in this traditional conception; and accordingly it is this tradition which is addressed in the present study.
former, the levels of description do not mesh: what is of the mind is separated by an impassable gulf from what is matter. The persisting irritation to dualists is the lack of an interface. In Leibniz’s theory that problem is eliminated by the continuity criterion which holds that spirit and matter lie in series. Specifically this signifies that in one aspect, or on one level of description, the world is spiritual; in its other aspect or level of description the world is physical and material. But clearly, in so far as they lie in series, these are not discriminable into separate partitions, since they (so to speak) slide into each other and preserve no essential difference between them.

Relative to point (c) the observation applies, that the double-aspect theory accords no specific ‘weighting’ or even ‘absolute’ status to the degree of reality that might be claimed for one or the other level of description. For although it is obviously the case that reductive analysis reveals ‘deeper’ facets of existence than phenomena can give us, they are not thereby endowed with ‘more reality’ – ‘deeper’ here denotes ‘underlying’, not more profound. In the final analysis, as we shall see, each level of description is indispensable to the others: neither physics nor mathematics nor metaphysics would yield a coherent picture of the world without the contributions of the others.

All this has an impact on the question of existence, which is entangled with point (a). How legitimate is it to propose that the existence of phenomena is a dependent existence? In one sense there is no issue: they do depend utterly on criteria that might be educed from the study of more fundamental strata of existence. But the danger of taking this in an absolute sense is, that it involves a futile expectation of answers to all questions from these deeper layers. Some phenomena cannot be explained at all by recourse to them, for example those in which given phenomena acquire different forms of organisation under changing physical conditions. We are in a better position today than Leibniz to respond to such ‘phenomenal idiosyncrasies’ in nature, and thus a brief excursion into contemporary theoretical science will serve to exemplify these aspects of the matter.

We speak routinely in our post-Einsteinian world of electrons, quarks etc. as ‘fundamental particles’. Such diction conduces readily to an appreciation of the itinerary of the subnuclear world as ‘hard little things (billiard balls)’. Importantly, however, this denotes a model, in other words, a visualisation of something that is ‘as it is’ in form quite different. Specifically, an electron is not a ‘thing’ in that sense, but an energy state of the atom it belongs to; and when (as we eloquently describe it) ‘it jumps orbit’, this designates a change in the ensemble’s energy state. In a strict sense, therefore, the electron is not a particle, but an event. But on our instruments they register as physical things.

Similar criteria abound wherever one looks in the fundamental sciences. Thus the statement relative to the Andromeda galaxy, “2 million light years away” does not mean one could roll out a tape measure to that location if we had one long enough. Nor does a measurement such as 3·10⁻⁸ cm, referring to the distance between the planes of atoms in crystals, mean that 330,000,000 of these piled on top of each other would reach a height of 1 cm. The value is in fact derived from certain equations arising out of the wave theory of light and not significant in the practical sense we associ-

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93 Leibniz’s objection is succinct and to the point: “It is true that M. Descartes sought to impose narrower limits on the soul by locating it in the pineal gland; but since he did not venture to say that it is restricted to some one point in that gland, he achieved nothing, and it would have made no difference if he had given the soul the run of its whole bodily prison.” Nouv. Ess. 221.
ate with ‘quantity’; but since we are dealing with vibratory phenomena it is clearly in-appropriate to think of definite, bounded, ‘hard’ objects.94

But the ambiguity remains with us even in examples taken from common experience. The wetness of water exerts a huge influence on the processes of our world. This quality is the result of congregations of \( \text{H}_2\text{O} \) molecules. But a single water molecule is not wet and nothing in its own specifications suggests wetness as a possible property. Moreover, the constituting atoms suggest in no way that they have a disposition to form water molecules. Although in one sense it may be a truism that ‘all matter is ultimately atoms’, yet atoms are already composites, and matter \( quia \) matter (atoms in aggregate) is ineluctably a plurality. And what kind of matter results is in most instances a function of which and how many specific atoms figure in the assembly, while the qualities exhibited (e.g. wetness) are not usually part of their physical constitution but an effect of dynamic interrelations. Moreover, these relations can change, in given circumstances. For example, internal reshuffling of a molecular aggregate may generate quite atypical accidents (known technically as ‘emergent properties’), for which we are still groping for exact explanations.95

The correlation between the idea of ‘levels of description’, ‘functional properties’ and Leibniz’s metaphysical principles would seem, then, to point directly to the conclusion that matter is an emergent property of specific monadic aggregation. We need to beware, however, not to read this in too simplistic a light as a straightforward cause-and-effect relation, for his monads are potentially both mind and matter. But with this we are beginning to run ahead of later discussions; what needed to be settled was the extent to which Leibniz can truly be said to espouse a double-aspect theory. Accordingly we are now prepared for any statement of his in which he might directly confront these problems. How gratifying, then, to find a text such as the one below with its forthright message:

It is indeed certain that every phenomenon has some cause. But if anyone says that the cause of phenomena is in the nature of our mind which contains the phenomena, he will affirm nothing false, but nevertheless he will not be telling the whole truth. ... Since all existents are interrelated, there must be a cause of their interrelations; indeed everything must necessarily express the same nature but in a different way.96

94 Our definitions of sizes and distances are based on physical conditions in the ‘intermediate’ world we inhabit; and it is not the most fortuitous of coincidences that the numerical results we obtain from measurements in the other ‘worlds’ look the same and we are deceived by the natural conclusion that they are all equivalent. But this is deluding ourselves; for as Bridgman notes, “the same name for these different concepts over the entire range is dictated only by considerations of convenience, which may sometimes prove to have been purchased at too high a price in terms of ambiguity.” Percy Bridgman: ‘The Logic of Modern Physics’; in: J. H. Weaver: The World of Physics, New York, Simon & Schuster 1987, vol. iii, pp. 847-50. Leibniz was fully aware of such ambiguities, a recurrent strain in his studies of continuity being that there are no objects with firm outlines – that all merge in some way with their environment (see Part III, infra). The paradoxical claim of the text above derives its justification from these criteria: vibratory phenomena have no clear outlines, and the warps and bubbles created by energy fields in space similarly render any claim to a straight-line distance of such length highly unreliable if they are interpreted in Euclidian terms.


96 Meth. Dist., G VII 319, L 365.
The italics in this paragraph have been added to lay stress on the critical pattern of Leibniz's thought. There is but one nature, although how this is expressed depends on the perspective (situation) from which it is expressed. By a completely unforced train of thought this leads to the conclusion that material beings express nature in a material way and spiritual beings express it in a spiritual way. Further, that material existents can express spiritual existents only in a material way; and conversely that spiritual beings will express material things in a spiritual way. This last-named characteristic evidently holds for human beings: as physical bodies we obviously interact in a physical way with material objects; but when we take cognition of the latter, it can only occur by way of our cognitive faculties – sensibility, imagination, reason, intellect: apprehension of like by like. In sensibly apprehending an object we do not bodily take it up into our faculties, but manufacture a representation. It will be observed that this Kantian way of depicting the process is not foreign to Leibniz; although it must be said at once that for Leibniz it has more subtle connotations. Meanwhile the text will serve as a precise indicator of the place held by phenomena in Leibniz's metaphysics. Moreover, it elucidates why a phenomenalist will not be accused of a falsehood, but of a nonetheless arbitrary demarcation in his/her descriptions of the nature of phenomena. In Leibnizian vocabulary, 'arbitrary' means that no reason can be given. For Leibniz, this is an unacceptable condition, tantamount to 'showing the seams' in the tapestry of arguments.

But the issue at stake in the double-aspect theory is plainly whether Leibniz reduces phenomena absolutely or not, or, to put it another way, whether he denies corporeal reality (existence) to some phenomena and not others. This is a difficult issue to handle, for it requires an assault on two levels simultaneously. One is based in his conception of matter, the other in his classification of phenomena, and they interlock so completely that one cannot treat fully of one without bringing the other into the argument; while the risk involved is either confusion from the ricocheting of illustrations or else that everything has to be said twice, once from each angle of vision.

It seems that the latter is nonetheless the preferable approach, for clarity is at all events preferable to disorientation. We shall therefore turn to his conception of phenomena first and attempt a classification. Leibniz never presents them in a systematic survey, but fortunately there is no scarcity of testimonia from his own pen, so that it can easily be reconstructed.

By the same token, the exhortation cavea lector has its application here. For Leibniz is very profuse with the term 'phenomena' and often charged with inconsistent, careless, ambiguous and even self-contradictory handling. Does he not, sometimes in one and the same document, give self-cancelling explanations of the same state of affairs? But on occasions like these it is well to remember that Leibniz was, in fact, an exceptionally acute and logical thinker; and on the whole his formulations and definitions are without peer in philosophical history. Any charge of contradiction must be

97 "One of the supreme intellects of all time," is the opening sentence of Bertrand Russell's chapter on Leibniz in his History of Western Philosophy, Simon & Schuster, New York 1945, p. 581. He goes on to say, "but as a human being he was not admirable." This is surely one of the classic instances of the pot calling the kettle black!

98 Ortega y Gasset devotes Chapter I of his work La Idea en Principio en Leibniz y la Evolucion de la Teoria Deductiva, Revista de Occidente, Madrid 1966 to a discussion of Leibniz's doctrine of principles and observes that of the 10 major principles of philosophy, no less than seven were introduced into the canon by Leibniz and that we still use his formulations (or reformulations) for the whole complement.
weighed into the balance with these claims; accordingly it is worth spending a moment on them for the sake of unravelling the knots of his habits.

All of Leibniz’s pronouncements on phenomena are contextual; thus in any seeming contradiction we should look first at the context in which it occurs. A first-rate illustration is a passage from the correspondence with de Volder.99 Here the writer is caught, ‘in flagrante delicto’, when he claims, first, that the reality of phenomena rests on their objective regularity, but then goes on to say that their reality depends on monadic aggregation. Now these are clearly incompatible statements.

But close inspection shows that the incompatibility is resolved contextually. For Leibniz first has to guard himself against the misinterpretation of subjectivism which de Volder levelled against him; this is accomplished by pointing to their causal regularity. But having done so he moves on immediately to address the Cartesian dogmatist who holds extension to be substantial. Thus de Volder had to be torn away from two correlated misconceptions in one breath, so to speak: namely that (firstly) phenomena are not real and (secondly) that phenomena are metaphysically encompassed in the concept of extension. For Leibniz, this does indeed result in a self-contradiction – but not his!

Evidently this applies, mutatis mutandis, to similar ‘contradictions’ that may be found in other documents. We must not forget that Cartesianism dominated the agenda in his day, so that Leibniz was always obliged to fight on two fronts simultaneously. As for his own view, he left it on exhibit in some of the most exposed places – thus in a letter to Arnauld (8 Dec 1686), where we find the sentence, “the rational soul is created only at the time of the creation of its body”.100 We have already seen that this sentence does not stand alone.

5. Leibnizian phenomenotaxis

The above observations are of value in preserving us from the inadmissible delusion that Leibniz helped himself to careless semantics in furtherance of his doctrines. Let us now proceed to a conspectus on phenomena, in which the commentaries seek to give as clear-cut a classification as may reasonably be imposed.

Each of these categories is affiliated to a corresponding Leibnizian term, although his purposes are not served by exclusive demarcation. We need to bear in mind that the lines between them are fluid. His purpose was not, after all, classification, but establishing criteria by which phenomena may be discriminated under the head of ‘seeming to appear’ and ‘actually appearing’ – basically the distinction between real and imaginary (or wholly subjective) phenomena.

On the whole Leibniz defines as ‘real’ those appearances which show a complete, persistent and lawful connection among each other, and to these he attaches clarifying adjectives such as phénomène bien réglé, phaenomenon reale, phaenomenon bene fundatum.101 These are commonly contrasted to phaenomena apparentia tantum, phaenomena sive apparitiones,102 apparitions internes, phénomènes liés.103 He also uses the contrast of ens reale vs entia apparentia sive falsa.104 Hereunder a selection of passages designed to illustrate the categorisation: to which only the rider needs to be added that in some Leibniz speaks of

99 De Volder, G II 283, I. 539.
100 Arnauld, LA/G II 75.
101 E.g. Rémond, G III 622.
102 Meth. Dist., G VII 319-20.
103 Thoad, Appendix, G II 404.
104 Des Bosses, G II 438
more than one species, so the context is important. (It goes without saying that many pages could be filled with more of the same.)

(a) **PRIVATE EXPERIENCES.** My personal experiences of the world which form part of my mental furniture and are not shared with any other party (e.g. 'qualia').

Descartes ... rendered a useful service in eradicating the prejudice that makes heat, colours and other phenomena seem to be things outside of us, since it is evident that the same hand on which water seemed very hot soon finds it tepid; and a man who observes a green colour in a powdered mixture no longer sees it as green when his eye is aided by an instrument, but as a mixture of yellow and blue ... 105

(b) **IMAGINATION.** Other personal experience may be generated altogether 'within', e.g. superstitions, apparitions, works of imagination.

Quakers ... claim that they find within themselves a certain light which itself announces what it is. But why call something light if it doesn't cause anything to be seen? I know that there are people with that cast of mind, who see sparks and even something brighter; but this image of corporeal light, aroused when their minds become overheated, brings no light to the mind. 106

(c) **PUBLIC FACTS.** Shared (public) experiences, which can be regarded as objective experiences. For these, a general consensus on their meaning exists which we encapsulate in the word 'facts'.

... phenomena preserve a certain order, which conforms to our nature, or so to speak to the world which is in us, which means that we are able to make observations which are useful for regulating our conduct, which are justified by the success of future phenomena, and in this way we are often able to judge accurately about the future by means of the past. This would be enough for us to say that these phenomena are true ... 107

In matters which do not possess metaphysical necessity, we must regard the agreement of phenomena as truth, since such agreement does not occur by chance, but has a cause. ... To this is added the great power of authority and public testimony, since it is unlikely that so many [phenomena] should conspire to deceive us. 108

Let us now see by what criteria we may know which phenomena are real. ... A phenomenon will be coherent when it consists of many phenomena for which a reason can be given either within themselves or by some sufficiently simple hypothesis common to them; next, it is coherent if it conforms to the customary nature of other phenomena which have repeatedly occurred to us, so that its parts have the same position, order, and outcome in relation to the phenomena which similar phenomena have had. ... But certainly a most valid criterion is a consensus with the whole sequence of life, especially if many others affirm the same thing to be coherent with their phenomena also. ... Yet the most powerful criterion ... is success in predicting future phenomena from past and present ones, whether that prediction is based

106 *Nouv. Ess.* §506.
upon a reason, upon an hypothesis that was previously successful or upon the cus-
tomary consist ency of things as observed previously. … 109

(d) ILLUSION. There are phenomena which in private and in public we acknow-
ledge not to be ‘real’. These include illusions, hallucinations, and perceptions which rests on momentary and accidental features of observation.

Extension, motion and bodies themselves, insofar as they consist in extension and motion alone, are not substances, but true phenomena, like rainbows and parhel-
ia.110

(e) ARBITRARY ORDER. Other ‘unreal’ phenomena include those which are arbi-
trarily or imaginatively determined, or which designate a collective treated as ‘one’. The first include zodiacal signs, ‘aggressive’ colours or the ‘Baltic Sea’. The others includes most collective nouns, like army, herd, swarm, forest.

Let us assume that there are two stones, for instance the diamonds of the Grand Duke and the Grand Mogul: one and the same collective name may be given to ac-
count for both, and it may be said that they are a pair of diamonds, although they are to be found a long way from each other. But it will not be said that these two diamonds compose one substance [even if they are brought] to the point of contact … if one were to set them in a single ring, all that will make only what is called unum per accident.111

(f) ABSTRACTIONS, such as those derived from mathematics and pure relations.

Space, time and motion have something akin to a mental construction and are not true and real per se …, [motion] is in fact nothing but change of situation; and thus motion insofar as it is phenomenal consists in a mere relationship.112

(g) WELL-FOUNDED PHENOMENA. Those which exhibit an indubitable unity, in that the mind which perceives has no need for imposing a cognitive unity on them and, secondly, in perceiving them, cannot splinter it into constituent parts without impairing the coherence of the object under scrutiny.

The principles of all the philosophers seem to suffice, joined with the naïve prej-
dice, both of which show no doubt that there is in any body something more than phenomena, that is, something more than continuous dreams, no matter how per-
fected these may fit each other. … The common sense of men seems to understand that there is something more in sensible bodies than phenomena consisting in the operation of the perceiving mind. And speaking only of natural events, there ought to correspond to this perception some object distinct from the perception itself; otherwise there would be no harmony.113

If bodies were mere phenomena, the senses would not deceive us on that account, for the senses put nothing forward concerning metaphysical matters. The veracity of the senses consists in the fact that phenomena agree with one another, and that we are not deceived by events if we properly follow the regularities built up from experience.114

110 First Truths, L 270.
111 Arnauld, LA/G II 76.
114 Ibid., AG 202.
Clearly (c) and (g) are the most important categories in conjunction and carry the burden of the double-aspect theory.115

The next and last set of quotations being drawn from a paper of 16 pages extent, it seemed best to intersperse Leibniz’s words with abridged accounts of his own internal commentaries:

Phenomena which agree with the rest are held to be true, whereby Body, Space, Time, World, Individual are also adumbrated. By means of this principle we distinguish dreams from the things that happen when we are awake. {We could not a priori distinguish a perfectly coherent dream from reality except that} all things are referred to a generic time and place, and are extruded from the rest according to certain particular laws. {There is also no reason why I should be the sole [solipsist] existent in the universe,} so it is beyond doubt that people who seem to be speaking with you today are people just as real as you. {Hence} the causes of phenomena, too, must be outside you. {Generic} space is common to everything {and} there is no body which cannot be thought to exist in this space and to be at a distance from some other given body.116 {But causal events occur in sequence, which we call time and is also generic.} Now with the aid of time and place we can distinguish individuals and decide which are the same and which are different. … Furthermore, the collection of all bodies that are understood to be in space, i.e. those that have a mutual relation, is called the world. {The various states of this world are for physics to treat.117} Every body acts on every other body, and is acted upon by it. … Even though all things are animated and act with sense and appetite, they nevertheless act according to the Laws of Mechanics. … All the phenomena of nature can be explained solely by final causes, exactly as if there were no efficient cause; and all the phenomena of nature can be explained solely by efficient causes, as if there were no final cause.118 … For just as a man neither acts nor is acted upon any the less in accordance with the laws of motion even though he has sensation and appetite, so the same thing will be understood in a certain proportion in the other animated beings.119

Today, we as legatees of Kant tend to assume a deeper though inaccessible realm of reality lurking beneath or beyond phenomena (noumena). This is a notion impossible to sustain within the Leibnizian metaphysics. To illustrate the difference, take the example of music, which science is apt to describe as the impingement on our auditory nerves of airborne molecules propagated by an energy source (voice, instruments) through a neutral and homogeneous medium. Moreover there are mathematically ascertainable frequencies involved in this stream of molecules which can be plotted on an oscilloscope. What science cannot illuminate, however, is the surface level of description, namely the decryption by the mind of these sounds as patterns meaningful to a cognitive apparatus. To this extent a legitimate case can be made that the ‘deeper’ knowledge is really quite trivial compared to the profundity evinced by the phenomenon.

115 It is not without merit to mention that the abundance of eligible quotations under these two heads constitutes a veritable embarras de richesse, obviating any need to pick and choose from only the ripest fruits!
116 “But those bodies which do not have a definite situation of this kind, such as a rainbow or an image in water, we therefore call emphatica or simply apparitions, for which we can nevertheless provide reasons from the actions of bodies.” (p. 243).
117 “The objections of sceptics are inane: for if all dreams agree with each other and obey the same laws, then [ap-]paritions of this kind we call true, and I do not see how they could be either rendered or chosen truer.” (p. 245).
118 Italicised by Leibniz.
In this example the great virtue of double-aspect theory is divulged as its capacity to preserve human values and to enlarge our cognitive horizons, where other theories lose those values and constrict our horizons to empty shells of abstract data. For although its explanatory regimen follows similar reductive trends, it is clear that in Leibniz’s thinking neither mathematical nor metaphysical knowledge make absolute claims on or against the degree of reality which rests in phenomenal knowledge. In this respect, Leibniz’s opposition to Cartesianism also shows to advantage. Epistemic criteria are basically ‘value-free’; but while this is a mandatory criterion to the facilitation of objective research, it is disastrously inappropriate when the results of these researches enter the stream of society. This hardly needs strong advocacy today, since we are more keenly aware than was possible 300 years ago of this deep problem for society.

Fundamentally, then, Leibniz’s concern was to oust the imaginary essences in natural philosophy that were upheld by the Cartesians, and their hypostatisation of extension and its modi as substantial qualities. The doctrine of res cogitans in turn resulted in a deficient scope of the delineations of clear and distinct perceptions.120 The unfortunate outcome was that the objects and events of the world had to be posited essentially as a succession of mental events, while its physics led to the designation of bodies – including animal bodies – as machines, not intrinsically different from man-made automatons except for their greater complexity. It was from this unacceptable consequence that phenomena had to be rescued.

Phenomena must accordingly, so Leibniz, be detached from substances and reassigned to the context of experience. Up to a point this sees Leibniz shaking hands with empiricism, but he adds the proviso that all facts and circumstances must retain their mutual relations without impairment across any temporal interruptions (e.g. a spell of unconsciousness will not destroy the continuity of experience of any consciously experiencing ‘I’). In this we are aided by the extension of our faculties beyond the practical/empirical (which we share with many animals) into the cognitive realm – into theoretical and speculative domains.121 Theories and hypotheses enable us to frame rational expectations by setting up a natural philosophy with correct basic principles, so that the error factor is reduced to testable instances of possible faulty individual propositions.

It must be noted en passant that for Leibniz natural philosophy is not an epistemic activity, or at least not primarily. Although he is obliged to acknowledge the agent of cognisance, the subject’s representations are neither true nor false: golden mountains and centaurs are legitimate contents of the mind as much as ‘proved’ empirical existents. It is their linkage to the faculty of judgement which turns these ‘givens’ into objects of cognitive discrimination. The contents of the mind must be submitted to rational analysis, and if they cannot be sustained under this scrutiny by matching to lawful empirical criteria, then the judgement will identify them as ‘imaginary’.

The value of Leibniz’s taxonomy of phenomena becomes clear when it is placed into the context of its natural philosophical motivation. It is necessary to have such a compartmentalisation by reason of its utility in empirical research, for phenomena are plainly the objects of scientific study. The interesting adjunct to this argument is the quality of reality that must, as a minimum, be accorded to them so as to produce a tight fit between the phenomena of the world and the methods of natural philosophy.

120 Leibniz’s own emendation of ‘clear and distinct perceptions’ is delineated in Medit., G IV 422-6, L 291-5.
121 Untitled paper, Ch. XV, G VII 331.
6. Phenomena can kill

This calls for an examination of one of the more recondite features of phenomena in Leibniz's metaphysics, and a great stumbling block to students in their endeavours to grasp its principal feature, namely the enigma that monads are unextended, yet supposedly capable of generating spatial phenomena by aggregation.

On learning this, one's immediate reaction is likely to be: how can two or a million monads acquire extension simply by being aggregated? A million zeroes similarly 'aggregated' still add up to a value of zero. A rough interpretive consensus therefore prevails in which phenomena are explained as the monads' perceptions. With apologies for the unsubtlety of description, these explanations in their majority boil down to a claim that extended objects do not 'actually' exist, being only the result of monads perceiving other monads, including what Leibniz calls their 'bodies' (these being the aspect of passive force). Now the latter are perceived as if situated in three-dimensional space and in time; or, put another way, monads cannot help perceiving each other spatiotemporally, even though spatiotemporality is a completely mental phenomenon – essentially a kind of collective illusion. Moreover, on account of pre-established harmony co-ordinating these impressions, they correspond to each other unilaterally so as to convey the further impression of causal relationships operating among them. This way, physical reality ends up being a purely solipsistic fiction.122

Yet if we recall our list of Leibniz's phenomenal species, the general meaning of 'phenomenon' in the context of physics and object reality (i.e. items (c) and (g)) is simply that of empirical facts apprehended by the human mind, which confers on them an order which is useful to us humans, though meaningless in an 'objective' sense. The vocable 'objective' is here presupposed to have an intelligible meaning, but although this is highly debatable in the context, we must let it pass for now.

The disparity between these two rivalling accounts of phenomena – i.e. the determination as illusory on one side and as factual on the other – can be captured in the observation that some phenomena can kill. Obviously a dune can kill by burying its victim; but the strict application of Leibniz's rules above reveals this to be a mere façon de parler. What we need to work out is the apparent disparity which arises from Leibniz's fundamental metaphysical entity, force, and its relation to phenomena.

As far as Leibniz is concerned there are 'true' phenomena, as concrete and physical as they are distinctly existent. What he insists on, however, is that the concept of matter as it stood in his day entertained faulty notions as to what it is.

Now it is almost a commonplace for today's 'man in the street' that matter and energy are interconvertible. From within the Leibnizian context, this poses no problems at all to an insistence on the physical nature of phenomenal interactions – and in some cases 'physical' also in the sense that it includes circumstances of an irretrievably fatal (and thus monodirectional) causality. There are at least three kinds of situation where this pertains, namely:

(a) Concentrations of passive force of a density which appears as 'hard' (impenetrable) can act on concentrations of lesser density which appears as 'soft' (e.g. a bullet on flesh): and this concentration of force is matter to

existents inhabiting a dimensional magnitude in which the definition of ‘hard’ and ‘soft’ can be meaningfully defined and repeatably confirmed;

(b) Compositions of force which exhibit the chemical reactivity we call ‘toxic’ (gaseous or liquid) may interact detrimentally with the chemical ensembles of which bodies are made. Chemical bodies are evidently matter by the same criterion as under (a), although it is understood to be in different phase.\textsuperscript{123}

(c) Radiation may detrimentally react with the chemical bonds in the matter tissues of bodies and destroy their integrity. Radiation is not matter in the same sense as (a) and (b), but lies in series with them.\textsuperscript{124}

We can see from these examples that the concept of matter, no matter how ambiguous it may seem from a phenomenal vantage point, is distinctly effective and real in a physical sense. It goes without saying, then, that the ambiguity which clings to it is relative to human intuition. We tend not to think of gas or radiation as matter, but to a physicist such distinctions are arbitrary. We might also say that to a microbe familiar with atoms as household gadgets, the concept of matter would be somewhat different than to a human. But the upshot is plainly this: that physical existents of a macroscopic size (e.g. correlated to animals’ sensory spectra) represent merely a particular phase of matter; whereas existents beyond the scope of those spectra (e.g. ‘energy’) represent another phase. In the macroscopic dimension some forms of ‘energy’ are perceived as ‘hard’, ‘liquid’ or ‘vaporous’ and can therefore have those consequences with which we are familiar.

Altogether, the above points show that Leibniz was exactly on cue in insisting on his version(s) of ‘phenomena’. In modern terminology we would merely rephrase the matter concept in terms of certain precipitations of force which in an appropriate dimensional setting must be understood as matter, so that ultimately matter is a particular phase of force. The concept of phase, not used by Leibniz but pertinent to his conception, answers to this specific perspective on the issue and represents a perfect exemplification of the double-aspect theory.

7. How much of the whole cloth?

Now the trend of all these observations is that there is a connection between appearances and their predictability which is easier to explain than it is to explain it away. The dilemma for scholars of idealist persuasion is based precisely in the fact that Leibniz leaves us with little doubt that God’s handiwork points to a reality which we may not suppress, let alone ignore. To substitute for this natural framework a claustrophobic dreamscape seems designed to cast aspersions on the Creator’s deftness with his substances – as if it were altogether beyond the pall to attribute to him

\textsuperscript{123} The term ‘phase’ identifies matter states as solid, liquid and vaporous. Animal and vegetable matter occupies in the main a unique phase of its own, called colloid, which denotes the resinous (fatty, waxy) material which is the principal life supporting material. The matter itself being the same in all these phases, this terminology indicates a change of ensemble properties which are self-evidently meaningful only to entelechial bodies whose survival depends on a recognition of the effect of these properties on its own bodily integrity.

\textsuperscript{124} It is not possible in this place to develop this principle beyond noting that radiation is the default behaviour of atoms irrespective of what kind of matter they comprise in aggregate. The claim that radiation lies in series with matter is consequently based on the fact that insofar as radiation is ‘ultimately atoms’, it is also ‘ultimately matter’.
the creation of a material world (which indeed the scriptures uphold as his very first act).

In our philosophising we should accordingly begin with what exists and ask of existents what the principles of existence might be, using logical or metaphysical or other pathways. If these lead to a denial of existents (excepting the subject), then the philosopher has merely compounded the problem he began with – essentially confessed that the boundaries imposed on human enquiry entail that there are no problems for philosophy to solve. This is likely to have been a significant aspect in Leibniz's confrontation with the philosophy of Spinoza and one of the issues which persuaded him of the imperative need to defeat this impasse.

We would now be in a position to close the lid on this case – except for the fact that Leibniz also delivered himself on frequent occasions of opinions in which tension and vacillation are manifest. The question then is whether these represent departures from the Leibnizian norm or may simply be accounted as the travails of genius with his recalcitrant materials?

Existent merit may accrue to idealistic interpretations from these Leibnizian vagaries. But in the end they merely reveal that idealism and indeed phenomenalism are not utterly incompatible with the double-aspect theory, but are absorbed by it. They do not, by themselves, comprise the whole cloth. Accordingly it is worthwhile to trace a little of this dilemma through Leibniz's writings.

A document from his earlier years – the letter to Foucher – shows an exuberant Leibniz extolling the virtues of his new theories of motion and its associated physics. But after confidently asserting that there must be external phenomena to explain external causes, he brings up a sudden volte face:

But strictly speaking, from all this it does not follow that matter or body exists, but only that something exists which conveys ordered appearances to us.”

For all intents and purposes, this statement cancels out what he said before; and indeed he continues with a version of Descartes’ evil demon who might convey such ordered appearances to us. Accordingly Descartes cannot be criticised for proposing that cogito ergo sum; for “even if there were only appearances and dreams, we would remain no less certain of the existence of him, who thinks.”

Which is altogether true, but it does not compellingly lead to the conclusion it insinuates. For the italicised phrase above opens a door on two corridors: One in which the only possible reality is that of thinking subjects with their dreams of an external reality – this is the path which proceeds from reading it as “something exists (a mind) which conveys ordered appearances to us.” The other favours the reading “something exists (objects, properties) which convey ordered appearances to (a mind)”. Leibniz disregarded this possibility in writing to Foucher and thus shot himself in the foot, even though it was his own point of departure in the letter!

When he takes up this issue again in the New System, Leibniz attacks it from another angle, that of atomism:

Material atoms are contrary to reason, besides still being further composed of parts, since an invincible attachment of one part to another (if we could reasonably conceive or assume this) would not at all destroy the diversity of these parts. It is only atoms of

125 His Theory of Abstract Motion and Theory of Concrete Motion, 1671.
127 Loc. cit.
substance, that is to say, real unities that are absolutely destitute of parts, which are the sources of action and the absolute first principles out of which things are compounded ...

But the expression “of which things are compounded” seems at once to reimburse the text with the ambiguity it is designed to remove. How can immaterial substances combine to make a divisible material substance? Here Leibniz might plausibly be understood as hinting that these atoms (a.k.a. substances), as the “sources of activity”, generate not so much body as the expressions of body.

But the idealist reading of this is that bodies comprise the sum of collective representations. This yield, however, is the exact opposite to what Leibniz intended to achieve in the New System. The pre-established harmony could be read as succeeding in confirming this unbridgeable incompatibility between mind and matter and, therefore, the utter impossibility of joining soul and body in any way whatever. But this is tantamount to an admission that only souls exist; that all other existence is a derivative of the souls’ representations.

To escape this dilemma, one critic of the ‘idealist’ persuasion, Hans Wolff, draws out an unexpected corollary. Perception of body, he writes, cannot be of nothing, after all: and we know that entelechies are loci of force. Accordingly:

Only when monads are understood as the bearers of organic and externalisable force can they be what Leibniz desired them to be: the origin of all life and development.

Here, then, is the crux of the matter, which indeed all our arguments hitherto have been designed to show – that the whole point of Leibniz’s ontology is precisely the ‘externalisable force’ of this passage: the idea that force may precipitate itself as body, and that, as body, it has the power to affect (and indeed kill) other bodies. In a word, the point is not that mind and matter, spirit and body are to be understood as incompatible substances, but as one substance capable of aggregation under different phases of existence. None of this contradicts either the phenomenalism nor the idealism imputed to Leibniz; but it does contradict the supposed incompatibility between idea and reality which sustains interpretations which stop short of the end of this road.

8. Sense certainty

A necessary corollary of the double-aspect theory is that Leibniz accorded sensory experience its due. Most of the New Essays are devoted to this theme, which reflect his thinking on the ‘common sense philosophy’ of Locke. Equally, he was acquainted with Campanella’s writings as comparison with a few trenchant quotations from the Calabrese philosopher makes clear:

A philosopher should follow the lead of the senses, for sense knowledge is absolutely certain, as it is acquired through the presence of its objects. As a matter of fact, we have recourse to the senses when we want to ascertain something of which we are not

128 NS, §11, L 456.
129 We have noted elsewhere in this study (but it bears iteration) that Leibniz, although he proudly advertised himself in subsequent publications as “the author of pre-established harmony”, never managed to convince any of his critics over a ten-year stretch of ever more intricate “explanations” that this brainchild of his was a genuine improvement over occasionalism: cf. Sect. A, §10 supra.
sense. ... Sense is the principle of knowledge and certitude. Nothing we imagine, think of, or enquire about with our reason is held by us for certain until we verify it by sense experience. ... Man does not reason or argue about things that are certain, but only about the uncertain. And in doing so he bases his reasoning on the things that he experiences to be certain. Hence sense is the light through which he sees what is in the dark. When anyone knows a thing by sense, he no longer looks for reasons or arguments. ... Aristotle is therefore wrong when he states that sense is less certain than reason, because reason gives the causes of things whereas sense does not. The truth is that sense is certain and does not require proof, since it is a proof in itself. On the contrary, reason is uncertain and needs proof. And when it looks for proofs or causes, it takes them from sense data.

Here is the Leibnizian version:

Rightly considered, all that is certain is that we sense, and sense congruently, and that some rule is observed by us in sensing, to be sensed congruously is to be sensed in such a way that a reason can be given for everything, and everything can be predicted. And existence consists in this, in sensation keeping certain laws, for otherwise everything would be like dreams. Further that many sense the same thing, and sense things that agree. ... Hence it is clear that so far from material things being more real than others, on the contrary there can always be doubt of their existence.

It is true that the senses cannot serve as arbiters, being prone to unreliable prognostications amid the fleeting impressions of their moment-by-moment decryption of physical reality; upon them the stigma lies heavily of being governed by appearances of all sorts. Yet there is a downside to eternal truths as well, such as those delivered by mathematics, for they give us too little reality to work with. Phenomena are far richer than a priori certainties; and many facts of supreme importance to us are altogether beyond its reach. But mathematics is superbly well equipped to furnish us with explanations on what occurs and how, once we have an adequate theory to account for it.

It shall suffice to add from his Discourse a final word, which for all intents and purpose confirms that Leibniz was always committed to the double-aspect philosophy which we have found him to be defending:

We can make observations that are useful for regulating our conduct and that are justified by the success of future phenomena, and that thus we can often judge of the future


133 Campanella, Epilogo, p. 490.

134 Op. cit., p. 145. – What these quotations in their nakedness do not reveal is a metaphysics which, for all its differences, touches hands with that of Leibniz in several interesting respects. Campanella’s whole philosophy is grounded in a principle of dynamis which swings between two destructive extremes, heat and cold, and explains through diffusion and compression the existence of the material world. Between these two polar opposites, nature rests in an equilibrium brought about by the striving of all existents for their self-preservation, which (as in Leibniz) leads to a principle of activity as the irreducible criterion for existence. Campanella sensualism is accordingly based in the idea that striving is necessarily matter-oriented and seamlessly continuous with the stability of the object world. For a full discussion, see Wilhelm Schmidt-Biggemann: Topica universalis – eine Modellgeschichte humanistischer und barocker Wissenschaft, Felix Meiner, Hamburg 1893, Ch. IV, ii, pp. 225-38.

135 A VI, 3, 511.
by the past without error, that would enough to say that these phenomena are true, without worrying whether they are outside us and whether others perceive them too.\textsuperscript{136}

Robert Adams, too, although he never so much as mentions the notion of a ‘double-aspect theory’, comes close to acknowledging that this is actually what Leibniz promoted – although to Adams (as a defender of Leibniz’s idealism) it seems a half-baked phenomenalism. He writes:

Leibniz seems to have regarded the two accounts [sense reality/idealism] as consistent. He sometimes gives both of them in the same document. … I think Leibniz believed that the two accounts are at least materially equivalent. He believed that there is a scientifically adequate story that is always at least unconsciously perceived by all monads and therefore counts as ‘true’, and that most of what appears consciously to conscious perceivers fits at least approximately into that story. He also believed that there are infinitely many monads whose internal properties are expressed by organic bodies that would figure in a sufficiently detailed extension of the true scientific story, and that aggregates of these monads (or of the corporeal substances that they form with their organic bodies) can therefore be regarded as the bodies that figure in the true scientific story. Thus the bodies of the true scientific story are real according to both accounts, both as coherent, harmonious phenomena and as aggregates of real things.\textsuperscript{137}

As always the best confirmation is that received at the hands of a scholar whose whole direction of interpretation runs counter to one’s own!

In the final analysis, what we account for in the interpretation of philosophical texts is their relation to existential reality. An account which terminates in a denial of this reality has more to answer for than is commonly admitted: for in their majority they either fail to address the problem by squeezing it into a pure-metaphysics straightjacket or else they propose that ultimately there is no problem (e.g. scepticism). Our travails with Leibniz have been geared to the understanding that his intentions were to ‘save phenomena’, i.e. to give an account of the connection between ideal and material worlds which restitutes the idea of a cosmos. The double-aspect theory described in this part of our study is an integral feature of that account; and it seems to affirm that opening doors to an ampler panorama than that furnished by narrowly focused readings yields both a more productive outlook and assures the coherence of a philosophy in which, traditionally, many loose ends have been known to resist their incorporation in the system as which Leibniz desired his philosophy to be known.

\textsuperscript{136} Disc. Met. §14.