

LEIBNIZ:
THE NATURE OF REALITY
AND
THE REALITY OF NATURE

JÜRGEN LAWRENZ

*Leibniz:
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and
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A Study of Leibniz's
Double-Aspect Ontology
and the
Labyrinth of the Continuum

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P U B L I S H I N G

The Nature of Reality and the Reality of Nature:
A Study of Leibniz's Double-Aspect Ontology and the
Labyrinth of the Continuum, by Jürgen Lawrenz

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I dedicate this book to
Caterina Pangallo
the joy of my soul,
who sustains and inspires
and keeps the light burning.

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Note on citations and translations

- (a) I have in every case given a form of citation sufficient for the unambiguous identification of the paper, letter or book from which it is drawn. Some titles are abridged, for which the sigla listed overleaf provide a key. All citations also give the original source (Gerhart, Akademie *et al.*) as well as the English translation I have used. Abbreviations of the editions also appear below. A full listing of literature sources is given in the Bibliography.
- (b) Extended citations are set off from the main text by smaller type and indentation.
- (c) If an author is quoted in the body text, this is indicated by doubled quotation marks (“”). Accordingly the use of single quotation marks serves to indicate the usual authorial highlighting.
- (d) All translations from the German, including material translated from other languages (e.g. Greek) into German, are my own.

Sigla used in the citation of Leibniz's writings:

(A) CORRESPONDENCE PARTNERS:

<i>Arnauld</i>	<i>Conring</i>	<i>Malebranche</i>
<i>Bayle</i>	<i>Des Billettes</i>	<i>Masham</i>
<i>Bernoulli</i>	<i>Des Bosses</i>	<i>Rémond</i>
<i>Bierling</i>	<i>De Volder</i>	<i>Thomasius</i>
<i>Bourguet</i>	<i>Fardella</i>	<i>Varignon</i>
<i>Burnett</i>	<i>Foucher</i>	<i>Wagner</i>
<i>Clarke</i>	<i>Huyghens</i>	

(B) ARTICLES AND PAPERS:

<i>Add. Expl.</i>	Additional Explanation of the New System
<i>Ars Magna</i>	Of an Organum or Ars Magna of Thinking
<i>Body & Force</i>	On Body and Force, against the Cartesians
<i>Chain</i>	Chain of Wonderful Demonstrations about the Universe
<i>Copern.</i>	On Copernicanism and the Discovery of Motion
<i>Crit. Thoughts</i>	Critical Thoughts on the General Part of Descartes' 'Principles'
<i>Demonstr.</i>	A Short Demonstration of a Memorable Error of Descartes
<i>Disc. Met.</i>	Discourse on Metaphysics
<i>Ess. Body</i>	Whether the Essence of Body consists in Extension
<i>Fardella</i>	Comments on Michel Angelo Fardella
<i>Freed. Poss.</i>	On Freedom and Possibility
<i>Inf. Num.</i>	Infinite Numbers
<i>Medit.</i>	Meditations on Knowledge, Truth and Ideas
<i>Met. Def.</i>	Metaphysical Definitions and Reflections
<i>Met. Found. Math.</i>	Metaphysical Foundations of Mathematics
<i>Meth. Dist.</i>	A Method of Distinguishing Real from Imaginary Phenomena
<i>Mon.</i>	Monadology
<i>Mot. abstr.</i>	Theoria motus abstracti
<i>Nec. Cont. Truths</i>	On Necessary and Contingent Truths
<i>Nouv. Ess.</i>	New Essays on the Human Understanding
<i>Philarète</i>	Conversation of Philarète and Ariste
<i>Phys. Nova</i>	Hypothesis Physica Nova
<i>Plast. Nat.</i>	Considerations on Vital Principles and Plastic Natures
<i>Pres. World</i>	On the Present World
<i>Princ. Gr.</i>	Principles of Nature and of Grace, founded on Reason

<i>Rad. Orig.</i>	On the Radical Origination of Things
<i>Refut. Spin.</i>	Refutation of Spinoza
<i>Reply</i>	Reply to Bayle
<i>Résumé</i>	Résumé of Metaphysics
<i>Spec. Discov.</i>	A Specimen of Discoveries
<i>Spec. Dyn.</i>	Specimen dynamicum
<i>Tent. Anag.</i>	Tentamen anagogicum
<i>Theod.</i>	Essays on Theodicy
<i>True Meth.</i>	On True Method in Philosophy and Theology
<i>Univ. Spirit</i>	Reflections on the Doctrine of a single Universal Spirit
<i>Univ. Syn.</i>	On Universal Synthesis and Analysis
<i>Wonders</i>	Wonders concerning the Nature of Corporeal Substances

Abbreviations used for Leibniz editions

- A* *Sämtliche Schriften und Briefe*. Akademie Verlag, Berlin 1923-.
- CB* *Philosophische Werke in 4 Bänden* in der Zusammenstellung von Ernst Cassirer. Übersetzungen von Arthur Buchenau und Ernst Cassirer, Felix Meiner Verlag, Hamburg 1904/1996.
- Ct* *Opuscules et fragments des Leibniz*. Ed. Louis Couturat, Alcan, Paris 1903; reprinted Olms, Hildesheim 1961.
- DS* *Deutsche Schriften I & II*. Ed. G. E. Guhrauer. Reprographic reprint of 1838 edition. Georg Olms, Hildesheim 1966.
- FL* *Fragmente zur Logik*. Ausgewählt, übersetzt und erläutert von Franz Schmidt. Akademie Verlag, Berlin 1960.
- G* *Die philosophischen Schriften von G. W. Leibniz*. Edited by C. I. Gerhardt. 7 vols. Berlin 1875-90; reprinted Olms, Hildesheim 1978.
- GM* *G. W. Leibniz: Mathematische Schriften*. Edited by C. I. Gerhardt. 7 vols. Berlin & Halle 1849-63; reprinted Olms, Hildesheim 1962.
- HH* *Kleine Schriften zur Metaphysik*. Herausgegeben und übersetzt von Hans Heinz Holz. Insel Verlag, Frankfurt/M 1965.
- L* *Philosophical Papers and Letters*. Edited by Leroy E. Loemker. D. Reidel Publishing Co., Dordrecht 1969.
- LA* *The Leibniz-Arnould Correspondence*. Edited and translated by H. T. Mason. Manchester University Press 1967.
- LC* *The Leibniz-Clarke Correspondence*. Edited by H. G. Alexander. Manchester University Press 1956.
- LoC* *The Labyrinth of the Continuum. Writings on the Continuum Problem 1672-86*. Edited and translated by Richard Arthur. Yale University Press, New Haven 2001.
- MR* *Leibniz's Monadology: An Edition for Students*. Ed. Nicholas Rescher. University of Pittsburgh Press 1991.
- NE* *New Essays on Human Understanding*. Translated by Peter Remnant and Jonathan Bennett. Cambridge University Press 1996.
- NS* *Leibniz's 'New System' and Associated Texts*. Translated and edited by R. S. Woolhouse and Richard Francks. Clarendon Press, Oxford 1997.
- P* *Philosophical Writings*. Edited by G. H. R. Parkinson. J. M. Dent & Sons, London 1973.
- SR* *De Summa Rerum. Metaphysical Papers 1675-6*. Edited and translated by G. H. R. Parkinson. Yale University Press, New Haven 1992.
- Theod.* *Theodicy. Essays on the Goodness of God, the Freedom of Man and the Origin of Evil*. Tr. E. M. Huggard. Routledge & Kegan Paul, London 1951.
- W* *Leibniz Selections*. Edited by Philip Wiener. Charles Scribner's Sons, New York 1951.

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Preamble

And just as the same town, when looked at from different sides, appears quite different and is, as it were, multiplied in perspective, so it also happens that because of the infinite number of simple substances, it is as if there were as many different universes, which are however but different perspectives on a single universe.¹

THE QUOTATION at the head of this chapter serves Leibniz as a metaphor for the innumerable possible perspectives on the universe which are all true, though each yields necessarily only a partial vision. It reflects his belief in our human capacity to achieve the truth on God's creation, and moreover that we have a *privileged* perspective on account of being endowed with the same faculty of rationality of which God himself is the supreme instance.

Philosophy is the endeavour to read the fingerprint of the creator on his works. For Leibniz this entails an acknowledgement that they are *on exhibit* for us to admire –

For God, as it were, turns on all sides and in all ways the general system of phenomena which he finds it good to produce in order to manifest his glory.²

and that the creator has provided a window for us to experience the world in its multifaceted abundance and discern cognitively its rational structure, even though its causal system extends into an infinitude of dimensions.

This has far-reaching implications for the study of his philosophy. There are two strains in his thinking, the worldly and the ideal; but to the philosopher of harmony these are aspects of *one* reality. The division brings in its train a recognition that the world of phenomena is immensely rich in variety, but finite; meanwhile the underlying causal structure is simple but infinite; and it is the office of metaphysics to guide us into the heart of

¹ *Monadology*, §57.

² *Disc. Met.* §14.

these connections, without fostering the illusion that we can ever attain a complete view.

But if the cosmos is one, then a philosophy purporting to embrace it must be. Leibniz was fond of stressing the systematicity of his thought, yet over time it shows a natural impulse towards prolixity and of resistance to pruning it of dying strands and purely decorative foliage. This poses significant problems of interpretation. Part of every scholarly effort is to make the congeries we call his 'works' look like a system.

It is a probative exercise, with temptation lurking at every corner to shift the pieces into a kaleidoscope of post-Leibnizian manufacture. What militates against it is the divorce of science from philosophy in the 18th century, which would have seemed folly to Leibniz. Open any page of his writings to see physics happily consorting with metaphysics – it is the pattern of his thinking. The cost of breaking this pattern is prohibitive; and it is primarily as a result of downgrading his 'worldly thinking' in some academic literature that Leibniz's philosophy has frequently come to resemble an introvert's mummery rather than the confident, sunlit rationalism which the pages of history portray.

There is hardly an indication in Leibniz's biography of an inclination or hankering after other-worldly concerns to which one could attach an idealistic, mystical or even deeply religious bent — his faith seems to have been conventional and, if anything, shaped by predominantly political considerations. This does not by itself argue for the absence of such perspectives in his philosophy; but scholarship has primarily occupied itself with the triad of papers known as the *Discourse*, *New System* and *Monadology*, resulting in a one-sided understanding of the nature of his philosophy which is countermanded by a considerable bulk among the thousands of other papers he wrote.

Our effort in this study is to leave intact what was *one* to the philosopher. Its subdivisions reflect the orientation we have sought to establish. Thus Part I comprises an elaboration of the *double-aspect theory*, Part II a refinement of the doctrine of force into an *ontology of agency*, and Part III the metaphysics of the *continuum*. What we hope to achieve is a cohesive portrayal of Leibniz's ontology. That it projects, like every true philosophy, a deep relevance into our own preoccupations in science and metaphysics,

may be noted in passing.

Our motto we take from Leibniz himself:

The genus world is one of a kind, which means no existents except bodies are given, and we sense them as souls or soul-like and not as bodies if they are not a certain distance from us. For if they were not given, one could not say if they exist now or not, which is contrary to first principles.³

There is no indication that Leibniz ever deviated from the idea encapsulated in these words, but it took him many years of thought and debate to draw all its implications into the light.

³ *Chain*, SR p. 107.

Introduction

1. The double-aspect context in Leibniz

The main issue to be articulated in this book is the proposition that Leibniz's mature philosophy is best, or preferably, presented as a double-aspect ontology. In its most evident meaning this implies that natural philosophy and metaphysics deal each with the same world, but gaze at it from different perspectives and therefore study aspects of its objects, events and features in a way which may then be taken as an account of two witnesses to the same story. This is a somewhat unusual procedure with this philosopher and therefore implies a new angle on the concerns of scholarship.

Accordingly it also involves clarification on how one might in such a context account for the fluctuations of standpoint discernible in the writings of his younger years as well as his increasing idealistic tendencies in the last decade of his life. In anticipation of such worries, it is best to state forthwith that our focus is on the period which may serve as the high watermark of his philosophical career — roughly the two decades before the turn to a new century. However, this does not exclude acknowledgement of some measure of overflow after its end as well as observing the enormous intellectual tensions welling up in the writings of his Paris years preparatory to this period of rich confidence and ample achievement.

Whether Leibniz subscribed wholly or in part to any of the positions commonly ascribed to him — be they idealism or realism, spiritualism or phenomenalism (or even Spinozism) — has been a happy hunting ground of scholars for over a century and a half since Feuerbach in his pioneering study of Leibniz's thought thrust idealism upon his audience as its dominant feature.¹ One aim of the present study is to pay close attention to the manifestations of such highly potent tensions in his oeuvre; and it may be said that the initial impulse for our traversal of the whole terrain

¹ Ludwig Feuerbach: *Darstellung, Entwicklung und Kritik der Leibniz'schen Philosophie* (1840), Vol. 4 of *Sämtliche Werke*, hrg. Wilhelm Bolin and Friedrich Jodl, Stuttgart-Bad Cannstadt, Frommann Verlag Günter Holzboog 1903-11.

under the aegis of a double-aspect theory arose precisely from dissatisfactions with the straightjacketing of Leibniz's ideas, which seems to acknowledge little of their ricocheting from one corner to another and resulting in something quite different — namely a willingness to espouse *all* these positions, albeit selectively and eclectically, and none of them exclusively.

Accordingly one virtue of a double-aspect presentation is, that it accommodates painlessly those seeming vagrancies, for it succeeds in furnishing us with a ready-made template for sifting the wheat from the spray. Moreover it facilitates recognition of stresses on the system and therefore the *need* for probing, repeatedly and insistently, every promising avenue of resolution and reconciliation. An example of particular relevance to this proceeding is the cardinal hinge of Leibniz's metaphysics of freedom, the transformation of the 'complete concept' into a startlingly novel 'law of the series', which could have made history if only it had been properly understood at any date earlier than 1974!² Together with the solution to the millennium-old problem of motion depicted in the *rota Algalzelis*, we encounter here two of the greatest achievements in the history of philosophy

Having thus forthrightly laid our cards on the table enables us now to enlist two Leibniz quotations which *speak the language* of a double-aspect theory, even though (obviously) this nomenclature was not part of his vocabulary. The first is a remark made to Rémond on the importance of worldly research in the pursuit of metaphysical truths:

You are right in judging that [my *Dynamica*] is to a great extent the foundation of my system; for it is there that we learn the difference between truths whose necessity is brute and geometrical, and truths which have their source in fitness and final causes.³

The second, roughly contemporaneous with it, appears in the *Monadology*, but occurs with such frequency elsewhere in his writings that it must be accepted as a fundamental axiom of his whole philosophy:

2 As is happens, the first scholar to deal with this issue was Anton Gurwitsch in his *Leibniz: Philosophie des Panlogismus*, Walter de Gruyter, Berlin/New York 1974.

3 Rémond, G III 645.

All our reasonings are based on two great principles: the *principle of contradiction*, by virtue of which we judge to be false that which involves contradiction, and true that which is opposed or contradictory to the false; and the *principle of sufficient reason*, by virtue of which we consider that no fact can be real or existing and no proposition can be true unless there is a sufficient reason why it should be thus and not otherwise, even though in most cases these reasons cannot be known to us.⁴

The meaning, or rather ramifications of this axiom, are not as obvious as a first glance suggests. For it comprises in all but name an articulation of his philosophy as a double-aspect theory by Leibniz himself. This emerges when we realise that the Principle of Contradiction represents the metaphysical prong of the theory which is concerned with *what is possible*, in other words the question of being. On the other side, the Principle of Sufficient Reason attends to *what is actual*, in other words already has being and therefore belongs to the prong of Leibniz's *ontological realism*.

Now that this crucial point has been brought into the open, we can put the whole issue into a nutshell as follows. For Leibniz the question of the origins of phenomena cannot be wholly and satisfactorily stated from a platform of strict adherence to any of the 'isms' previously named. Philosophy must be allowed to open two windows on causality and to operate as a double-aspect ontology. He blends, so to speak, his ingredients in different proportions to suit his purposes. In this pliancy his writings show up favourably vis-à-vis the sometimes exaggerated dogmatism of his commentators in favour of one to the exclusion of the other.

Before proceeding with a conspectus of its elaboration in these pages, it seems fitting to preface a few words on the 'central character' of the play. The Monad must have had as many interpreters as Hamlet; yet as every ambitious actor new to the role must surely return to Shakespeare's own words and eschew the accumulated fads and idiosyncrasies of the stage, so every student of Leibniz should be obliged at least once in their life to read the relevant texts as if they had sprung newly minted from the press and interrogate the tradition on the legitimacy of its internal sources. It goes without saying, perhaps, that this demands an exacting

4 *Mon.* §31-2.

scrutiny of especially those points of view which the philosopher himself explicitly embraces or rejects, as well as attention to utterances of his that are remitted to audiences whose prejudices he judged to be unfavourable for a clear and unambiguous statement. We will be obliged from time to time to take such discrepancies into account and to insist on readers laying aside any preconceptions they may harbour due to not being aware of who Leibniz is speaking to.

2. *Conspectus*

Fundamentally Leibniz's philosophy is concerned with a solution to the problem of motion, which is part of a larger set of problems entangled in the question of what we may understand by the locutions 'mind', 'matter', 'existence' and 'cosmos'. It was a life-long pre-occupation with (admittedly) many loose ends and much trial and error as part of the investigative process. But he did eventually score a bull's eye; and on this achievement rests the warrant for immersing ourselves to such depths in his travails.

The following run-down offers a bird's eye view of the whole topography of Leibniz's system. After perusal of the whole book, the reader may even come to observe the little irony in such a proceeding, in that this conspectus figures a kind of analogue to the Leibniz's 'complete concept', against the full elaboration of the 'law of the series' of the same system!

CHAPTER 1 leads into it with his first published foray, the *Hypothesis nova*, where that odd couple Anaxagoras and Hobbes supplied him with two agenda points that were destined to form the pillars of his future system: namely serviceable notions of (a) a self-moving agent (*nous*) and (b) a punctiform 'endeavour' — both distant ancestors of the monad as the one substance from which all creation may be explained.

CHAPTER 2 marks a new departure in Leibniz's selective adoption of Aristotelian and Scholastic notions in answer to a glaring flaw of the Cartesian account of motion. It is fundamental to everything that follows, for it is at this juncture that we see the beginning of a reconstitution of ontology from substance upwards, which must necessarily issue in a double-aspect theory. The spark which lit the fuse was Leibniz's recognition that between atomism, corpuscularism and the doctrine of *res extensa*,

the logic of explanation collapsed: the presumption of transfers, influxes and the like ultimately defeats itself because force cannot be shown to wander in and out of material substances. Accordingly a “higher, metaphysical principle” is required: namely that force precedes motion because *motion is not an act*, but the *outcome of an act*. From which it follows that a substance or entelechy must be its source, and this in turn dictates that substances cannot be *things*. From here Leibniz goes on to examine *corporeal substances* as exemplifications of his (double-aspect) theory that substance *qua* power is activity—as such in its two-fold manifestation as spirit and matter, mind and body, i.e. exerted force and restrained force. So there are not two principles, but two derivatives of one, so that all matter contains corporeal substances and all bodies contain entelechies. The chapter ends with an account of Leibniz’s definitive version of substance, the so-called *Bernoulli Monad*, which is the double-aspect exhibit par excellence in that it legitimises both the *reduction of matter* to its primitive state and the *constitution of matter* from substance upward.

CHAPTER 3 settles on the newly-gained ontological platform which stipulates as the fundamental premise of Leibniz’s metaphysics that *spirit and body lie in series*. The dual substance doctrine is an error; physics and metaphysics are each descriptions of *aspects of an unbroken continuum* of reality. Where the double-aspect theory makes its prominent mark is in Leibniz’s exemplary account of phenomena. This emerges most clearly from the phenomenotaxis which has been collated in this part of the work — apparently the first such exercise in the scholarly literature. What this tabulation reveals is the precise extent to which phenomena possess autonomy or depend on the ordering powers of the mind. The attribution of an exclusively idealistic frame of mind to Leibniz is divulged to be a fundamental error, for the whole exercise turns on the principle that mind is not prior to matter, but co-eval with it and an offspring of the same substance from which all actuality springs. The significant difference is that the mind’s (the subject’s) perceptions involve understanding — *inter alia* of the entire monadic ensemble as a cosmos. Finally, we broach an underestimated aspect of Leibniz’s ontological realism, namely his insistence that subjects sense other subjects and objects, and that no other criterion can vouchsafe actual existence.

CHAPTER 4 brings Leibniz's conception of *force* into focus. As distinct from Newton, whose account comprises an *operational definition*, Leibniz demands an ontological account. This desideratum he discovered to be beyond the reach of practical science;⁵ but the metaphysical outcome was a definition of substance as comprised of an *eigenforce*, or residual power, which might manifest itself as active or passive, exerted or inert. The all-important criterion here is that the monad does not *have*, but *is this force*. This criterion leads compellingly to the conception of *frames of reference* (a.k.a. double-aspects) in the vis-a-vis between corpuscular materialism and its (metaphysical) bedrock.

CHAPTER 5 accordingly deals with the second prong of Leibniz's ontology, the *Daseinstreben*, or 'striving for existence', which is the equivalent of individuation. Central to this picture of genesis is the purely theoretical status of 'the monad' in its inception: actuality involves collectivisation and compossibility within the total ensemble of monads.

This implies a departure from the Biblical account of the material creation and a turn towards a *theory of a self-constructing universe* by autonomously acting monads. Accordingly the earlier phenomenotaxis is here complemented by a schematisation of the ten main issues entangled in the conception of *agency*.

CHAPTER 6, dealing with corporeal substance, finds that (a) animate bodies are ensembles of individuals, but (b) such bodies require a dominant monad to be regarded as unities. The several hints at panpsychism are resolved along the axis of a now fully established double-aspect ontology.

CHAPTER 7 brings up its final version. Here the determinist Leibniz, finding irresolvable aporias clinging to the 'complete concept' of an acting substance, shows the courage of his convictions by scuttling the idea in favour of a contingency-driven 'law of the series' which is divulged as *the system of monads as the principle of organisation of substances and their predicates*. Since

5 In this endeavour, the wisdom of praxis was on Newton's side; for although Leibniz never conceded intellectual defeat, it became clear to him eventually that his methodology in the *Dynamica* and associated papers involved him in unmanageable complexities while yielding Newton's results again! The positive outcome for us, however, is a mutually complementary account, science and metaphysics for perhaps the last time shaking hands.

this is a future-oriented, monodirectional and asymmetrical information flow, it cannot be inspected at any instant prior to its consummation nor intelligibly reduced to any putative primitive 'state'.

From this vantage point there is a natural transition to the "Labyrinth of the Continuum" — Leibniz's metaphysical laboratory, which we explore in CHAPTER 8. This is where the double-aspect theory is most opportunely placed to elucidate the segregation of perspectives: where the phenomenal world as *actual* and the labyrinth as *ideal* are dovetailed. Leibniz declares his colours — *natural philosophy concerns the world of objects and events, their properties and relations, while the labyrinth is the realm of its foundations.*

The *Principle of Continuity* covers the vast range of *indeterminate parts* which serve as the foundations of *real parts*. Case studies are brought to the fore: *petites perceptions*; the principle of least action; the *rota Algazelis*. The upshot is a revelatory account of the true nature of time, space and thing-in-motion as a 'co-operative venture' between mind and phenomena.

In CHAPTER 9 we meet *shapes, limits and boundaries*. For Leibniz, phenomenal states represent the infolding and unfolding of order. All existents are infinitely flexible, without fixed boundaries and in continuity with the plenum: accordingly "there are no precise shapes in nature".

The principle of sufficient reason ensures that ultimately each perspective in the double-aspect theory is a valid (but not exclusive nor solely true) window on infinity. The heading that could be written across this entire chapter is Leibniz's celebrated 'minimax' principle: that God so planned the world that *the smallest number of laws would yield the greatest richness of phenomena.*

Finally, CHAPTER 10 is concerned with grounding existents; in other words, with the principle of sufficient reason, ontological arguments and the special problems Leibniz sought to solve in connection with this and the identity principle.

The virtue claimed in this thesis for the double-aspect theory is not only that it lifts the stigma of one-sidedness from accounts of Leibniz's philosophy. Of much greater moment is the possibility

of penetrating into the thought of an exceptionally deep enquirer into the relations between world and man through more than one, fairly restricted, portal. The widening of horizons is thus an enabling feature in the study of a system of philosophy which is surely among the most far-reaching such enquiries ever undertaken. The double-aspect theory, we believe, reveals a greater variety of facets, an inner coherence and especially an immense richness of thought than the more traditional insistence on just one primary aspect.

Part I



The Young Leibniz and the Problem of Kinesis

1. *Early directions*

First impressions are always important, although it would be rash to surmise that they must decisively shape the mind which receives them. The study of a powerful thinker's formative years is nevertheless justified by the finding that their mature ideas can often be traced back to embryonal concepts engendered by their youthful enquiries. In a flexible and inquisitive mind these may linger for years, even decades, and be constantly subjected to probing and questioning, until an impulse arrives which totally transforms them even as their initial semantic kernel is preserved.

In searching for early traces of Leibniz's thoughts on what was eventually to become his doctrine of monads and the continuum, we are helped by a recollection of his teenage notions (Leibniz was a precocious philosophical thinker) in a letter to Nicholas Rémond:

After finishing the Ecole Triviales I fell upon the moderns, and I recall walking in a grove on the outskirts of Leipzig call the Rosental at the age of fifteen, deliberating whether to preserve the substantial forms or not. Mechanism finally prevailed and led to me to apply myself to mathematics. ... But when I looked for the ultimate reasons of mechanism ... I was greatly surprised to see that they could not be found in mathematics but that I should have to return to metaphysics. This led me back to entelechies and from the material to the formal and [in the long term (ed.)] to monads or simple substances.¹

Revealed in this self-analysis is a juvenile concern with one of the earliest and most abiding philosophical problems of all — which here we call the *problem of kinesis*. It is a problem that powerfully infected his mind and in fact occupied centre-stage in his researches throughout life, so that we will profit from a brief look at how he set about tackling it in his early maturity — the late

1 Rémond, G III 606, L 655.

Sixties culminating in the *Hypothesis* of 1671. The seeds for his eventual solution were laid into these furrows, although it took a full decade for them to blossom out into a metaphysics that might be called a fully adult philosophy.

What intrigues us here is his search for authorities on whose ideas he might lean in the effort of dovetailing ancient with modern thinking, and how the search beam would alight in a long-range backward glance on *Anaxagoras*, while in the short range it would settle on *Hobbes*. The choice of *Anaxagoras* appears apt inasmuch as his device of the *nous* as the agent to put his cosmic whirlpool in motion represents an early attempt to explain the presence of energy in the cosmos so as to account for the motions of material objects.² The choice of *Hobbes*, on the other hand, may occasion some surprise in that the concept which *Leibniz* took from him, *conatus*, was a well-used scholastic notion. But it was *Hobbes*' idiosyncratic interpretation that attracted him.

What is at issue here must be briefly described. It is the concern with explaining how inanimate objects can move and the source of their motions. An inanimate thing like a nail lying dead on a table cannot be animated by any conceivable process. However a *magnetised* nail does pose certain comprehension problems which have from time to time been overcome by supposing it, as *Thales* reputedly did, to be inhabited by spirits, or else by positing some 'principle' of attraction/repulsion that may allay the vexation. But irrespective of how it is explained, it will not affect the understanding of the nature of the nail itself. Whether 'inspired' or 'imprincipled', it is still a dead thing.

2 The relevance of *Anaxagoras*' thinking for the origin and development of scientific (as opposed to philosophical) concepts is frequently debated in the literature. While the standard interpretation to be encountered in scholarly writings (e.g. *Kirk, Raven and Schofield, The Presocratic Philosophers*, 2nd ed., Cambridge University Press 1995, pp. 352–84; or *Wilhelm Nestle, Die Vorsokratiker*, Eugen Diederichs, Düsseldorf 1956, pp. 43–8) tends to focus on its metaphysical aspects and to stress the shared elements of that doctrine with such contemporaries as *Heraclitus*, *Parmenides*, *Empedocles*, the *Pythagoreans* and others, scientifically oriented writers (e.g. *George Sarton: A History of Science, Vol I: Ancient Science through the Golden Age of Greece*, John Wiley & Sons, New York 1964, p. 241ff.; *D. Gershenson and D. Greenberg, Anaxagoras and the Birth of Physics*, Blaisdell Publishing, New York 1965, pp. 6–51) endeavour a portrait much closer allied to recent notions of a natural philosopher a.k.a. scientist. The last-named authors in particular credit *Anaxagoras* with the invention of the concept of a molecule as the ultimate building block of material objects and derive from this a claim for *Anaxagoras* as the originator of the idea of physics.